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COMMERCIAL FISHERIES REVIEW

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UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.

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COMMERCIAL FISHERIES REVIEW



BUREAU OF COMMERCIAL FISHERIES
DONALD L. MCKERNAN, DIRECTOR
DIVISION OF RESOURCE DEVELOPMENT
RALPH C. BAKER, ASST. DIRECTOR

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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COVER: Shows Bering Sea catch of a Japanese trawler. The catch consists mostly of Alaska pollock and arrowtooth flounder (also known as turbot). A few tanner crab can be seen in lower right hand corner. A total of 14 Japanese bottomfish fleets (2 fish meal fleets and 12 freezer fleets) operated in the Bering Sea in 1964 and caught over 400,000 metric tons of bottomfish, surpassing the 1963 catch by about 100,000 tons. Only about 2,000 tons of halibut and 6,000 tons of sablefish were reported in the 1964 catch which consisted mainly of Alaska pollock, rockfish, flatfish, and herring. Japanese bottomfish operations in the Bering Sea expanded rapidly in 1960 and reached a peak in 1961 when 33 fleets reported a combined catch of over 600,000 tons. Since 1961, fewer Japanese fishing fleets have gone to the Bering Sea, but the size of Japanese catcher vessels in the Bering Sea has increased. Japanese larger stern trawlers (serving as fishing vessels and motherships) made their first appearance in the Bering Sea in 1964.

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SALMON TRAVEL

All Atlantic salmon tagged in the Narraguagus River, Maine, by the Maine Atlantic Salmon Commission, that have been recovered outside the river, have been taken in ocean waters and not in other salmon rivers. According to a biologist, several have been recovered in commercial nets in the ocean from the vicinity of Nova Scotia (170 miles), Newfoundland (760 miles), and as far north as 30 miles above the Arctic Circle on the west coast of Greenland.



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COMMERCIAL FISHERIES REVIEW

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REVIEW OF INDUSTRIAL BOTTOMFISH FISHERY IN NORTHERN GULF OF MEXICO, 1959-62

By Charles M. Roithmayr*

BACKGROUND

The problem of unwanted fish caught in commercial harvests is not new to the United States fishing industry. An effort to find a solution resulted in a report published in 1907 by the U. S. Bureau of Fisheries. The only practical suggestion offered at that time was to develop the utilization of those species having no market.

In 1952, the Gulf coast fishing industry attempted to solve the problem of marketing small bottomfish, weighing less than 1 pound each and caught incidentally in shrimp trawls, by constructing a petfood plant at Pascagoula, Miss.

Production of such fish gradually increased each year thereafter, and by 1958 ten plants at 6 ports located in Mississippi and Louisiana processed approximately 41,000 tons (fig. 1). Additional use of fish was made at that time by the poultry industry in the form of fish meal, and by the fur-farming industry (especially for the feeding of mink). Production decreased slightly in 1960 and 1961, but increased again in 1962 to a record catch of 48,000 tons valued at \$1.6 million ex-vessel. Of the total catch processed, 85 percent was canned as petfood, while the remainder was frozen for mink food and crab bait, and dehydrated into fish meal. Mississippi led all states, accounting in 1962 for 40 percent of the total United States petfood pack with a value of \$14.9 million to the Mississippi canners. The total United States pack of animal food from fishery products in 1962 amounted to 7.8 million cases--more than twice the salmon pack and more than one-half of the tuna pack for human consumption.

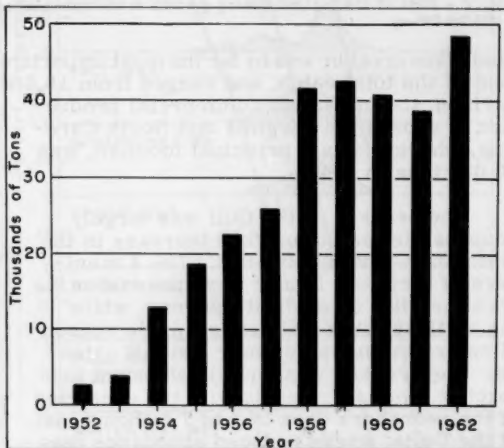


Fig. 1 - Industrial bottomfish landings of the northern Gulf of Mexico.

In 1958, the Gulf States Marine Fisheries Commission recommended that funds be made available to make a study of the industrial fishery of the northern Gulf of Mexico. Later that year the Fish and Wildlife Service assigned biologists to survey the species and size composition of landings made by the bottomfish fleet at Pascagoula, Miss. The principal objectives of the study are to detect changes that may occur in the fish populations, and to obtain life history information for the major species. The present report deals with some of the results obtained from 1959 through 1962.

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PRESENT FISHERY

Fishing for bottomfish is presently conducted over the inner Continental Shelf near the Mississippi River Delta (fig. 2). A resident fleet of approximately 50 trawlers generally seek

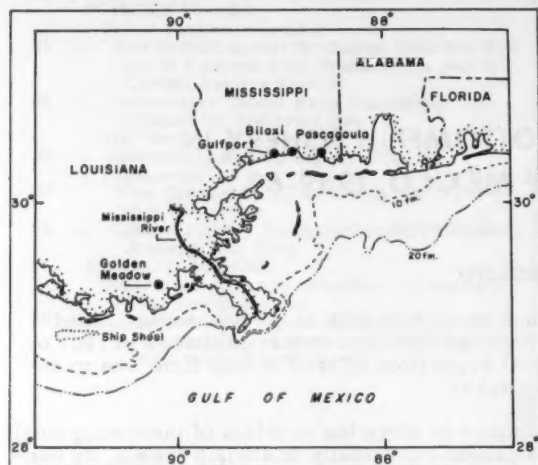


Fig. 2 - Ports of landing and fishing grounds in the industrial bottomfish fishery.

fish in 4 to 20 fathoms from Ship Shoal, Louisiana, to the southeast coast of Alabama; and land their catches at Golden Meadow, La., as well as in Gulfport, Biloxi, and Pascagoula, Miss. Within that area, the 10-fathom curve averages about 10 miles from shore. The sea bottom consists largely of mud and sand, and is generally level, providing excellent trawling conditions.

The shallow waters of the northern Gulf are characterized by an abundant variety of fish. Sixty-five families of fish, including over 170 species, have been identified in the commercial bottomfish landings.

Four members of the Sciaenidae, or drum family, contributed significantly to the overall production (fig. 3). On the average, croaker, spot, sand sea trout, and silver sea trout accounted for 72 percent of the annual landings during the 4-year period.

The croaker was by far the most important species harvested each year, averaging 53 percent of the total catch, and ranged from 19,000 tons in 1959 to 28,000 tons in 1962. By comparison, the maximum commercial production of croaker in Virginia and North Carolina, where it was a principal foodfish, was 30,000 tons in 1945.

The croaker of the Gulf was largely responsible for the marked increase in the bottomfish landings in 1962. The 4 members of the drum family were present in the trawl catches throughout the year, while the cutlassfish, or silvereel, made seasonal contributions to summer and fall catches. The croaker was equally abundant in catches from all grounds with the exception of the nearshore area in 1 to 7 fathoms east of the Delta, where reduced abundance may have been due to the presence of large amounts and a great variety of other species. The spot was approximately two times more abundant east of the Delta, while both species of sea trout were 2 to 3 times more abundant west of the Delta. The cutlassfish was more plentiful in catches from the nearshore grounds east and west of the Delta.

A major portion of the life history project involves the separation of age groups, or year-classes, of each of the four major species contributing to the fishery, the purpose being to expose any variation in relative abundance of successive age groups, and to determine what effect it has on the commercial catch. One to 8 life history samples were obtained each week from commercial catches landed at Pascagoula, Biloxi, and Gulfport, Miss., since July 1961. One hundred fish per sample were measured for total length. Subsampling every fifth fish provided scales for age studies, weight measurements, sex, and stage of sexual maturity.

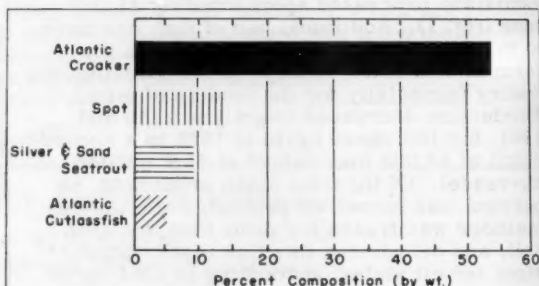


Fig. 3 - Relative production of principal species, 1959-62, in the industrial bottomfish fishery of the northern Gulf of Mexico.

ANALYSIS OF LENGTH AND WEIGHT DISTRIBUTIONS FOR CROAKER

The findings reported in the following discussion are restricted to the croaker. Attempts to use the scale method of age determination have had limited success since annuli, or year marks, are difficult to determine. Therefore, analysis of length and weight distributions, despite acknowledged subjectivity, has had to be relied on for age determination. The results reported in this study are to be considered preliminary. Samples of croaker were available from the inshore estuaries and sounds, as well as from the nearshore areas in the Gulf in abundant quantities for the first time in October 1963. The inshore material was obtained from collections made in Mobile Bay and Mississippi Sound by personnel of the Alabama Marine Resources Laboratory.

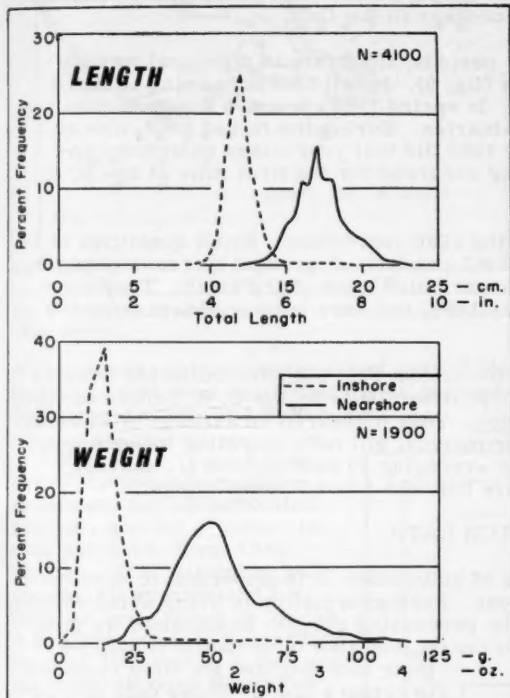


Fig. 4 - Frequency distributions--Atlantic croaker, east of the Delta, October 1963.

Length measurements of 4,100 fish clearly show the presence of two size groups from east of the Mississippi River Delta between Chandeleur Island and Mobile Bay (fig. 4). The average length of fish caught inshore in Mobile Bay and Mississippi Sound was 12 centimeters (almost 5 inches). Fish captured nearshore in 2 to 7 fathoms in the Gulf averaged 17 centimeters (nearly 7 inches).

A similar separation of croaker into two size groups was evident by using the weight determinations of 1,500 fish. The average weight of inshore fish was 15 grams, or about one-half ounce, while nearshore fish in the Gulf averaged 50 grams, or nearly 2 ounces.

Associated data on sexual maturity of those fish showed that 97 percent of the inshore fish examined were virgin, and the remainder were in spawning condition, or had recently

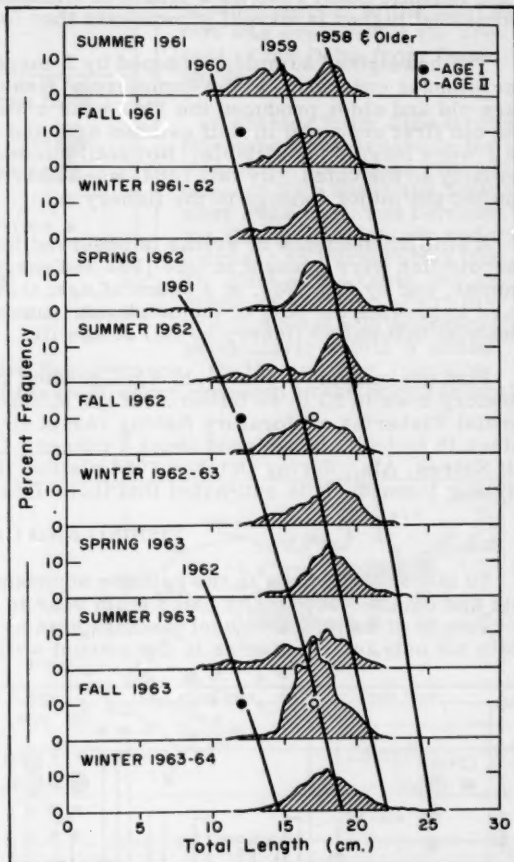


Fig. 5 - Length frequency distribution--Atlantic croaker in the industrial bottomfish fishery of the northern Gulf of Mexico.

spawned. On the other hand, no virgin fish were evident in nearshore samples from the Gulf, while 43 percent were either ripening or ripe.

Previous studies of croaker east of the Delta since 1961 showed that quantities of ripe fish were present from 3 to 7 fathoms in the Gulf from September through November. Assuming that to be the principal spawning period, it is hypothesized that the smaller size group of 5-inch fish present in the inshore waters during October 1963 was spawned in fall 1962, and may be identified as the 1962 year-class. Larger fish, which average 7 inches in length, are 1 year older, constitute the 1961 year-class, and are spawning for the first time. It is tentatively concluded, therefore, that those are largely 1- and 2-year-old fish. The croaker on the Atlantic coast reaches a length of 7 inches at the end of the first year, which indicates a somewhat higher (average) growth rate than for croaker in the Gulf.

The unweighted samples, grouped by 3-month periods, illustrate in a general way how year-classes contribute to the commercial fishery (fig. 5). In fall 1961, spawning of fish 2 years old and older produced the 1961 year-class. In spring 1962, juvenile fish less than 1 year old first appeared in Gulf catches near the estuaries. During the fall of 1962, fish at age I were largely unavailable. Not until summer 1963 did that year-class contribute appreciably to the catch. By fall 1963, when spawning occurred for the first time at age II, it supplied the major tonnage to the fishery.

A similar sequence of events is observed for the 1960 year-class. Small quantities of 1-year-old fish were present in late 1961 and early 1962 catches. A gradual increase began in summer, and by fall 1962, at 2 years of age, they contributed most of the catch. They continued to provide the bulk of the catch until summer 1963, but were largely absent from the industrial bottomfish fishery by fall at age III.

Fish presumably 3 years old were present in November 1961 samples collected from exploratory tows in 30 to 40 fathoms off the Mississippi River Delta by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. They measured an average of 21 centimeters (8 inches) and weighed about 3 ounces. Commercial gill nets operating inshore near Gulf Shores, Ala., during October 1963 yielded fish averaging 30 centimeters (12 inches), weighing 1 pound. It is estimated that those fish are between 5 and 7 years of age.

FISHING AND CATCH DATA

To measure changes in the relative abundance of bottomfish, it is important to have complete and detailed records of catch from year to year. Such information is being obtained from the records of individual vessel landings kept by the processing plants. In addition, we must obtain not only information as to the amount of fish caught, but also information regarding their location, and the time required to capture them. Those data are being collected by means of personal interviews, and from logbooks being kept by vessel captains.

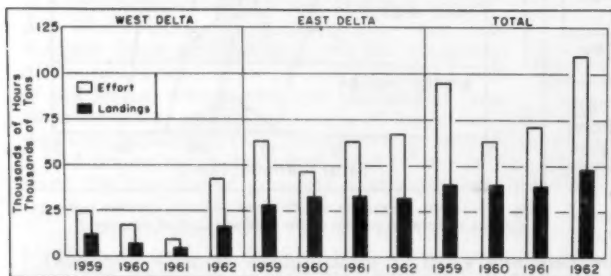


Fig. 6 - Effort and catch statistics in the industrial bottomfish fishery of the northern Gulf of Mexico.

west of the Delta declined by more than one-half between 1959 and 1961, but increased three-fold in 1962. Comparative effort data show that the increase in total landings in 1962 was the result of the increased effort expended by the fleet on west Delta grounds.

Annual landings varied only slightly from an average of approximately 40,000 tons during the period 1959-1961, but increased to 48,000 tons in 1962 (fig. 6). Landings originating east of the Mississippi River Delta remained comparatively level during the 4-year period, averaging 31,000 tons, or 76 percent of the overall total. On the other hand, landings from

On the average, fishing from December through May occurred between Point au Fer, La., and Southwest Pass, La.; and from Pass a Loutre, La., to Perdido Bay entrance, Fla.; and offshore to a depth range of 20 to 30 fathoms (fig. 7). The grounds

most heavily fished each year were in 8 to 12 fathoms off Chandeleur Island, Horn Island, and Petit Bois Island; in 5 to 12 fathoms east of Mobile Bay entrance; and in 8 to 12 fathoms off Timbalier Bay, La. Seventy percent of the total effort was expended in the area east of the Delta from December through May.

Fishing from June through November was generally limited to the nearshore grounds between Ship Shoal and Southwest Pass, La.; and between the Chandeleur Islands and the entrance to Perdido Bay (fig. 8). East of the Delta, the amount of seasonal effort increased markedly nearshore, particularly within 5 miles

of the barrier island beaches, and east of Mobile Bay entrance. On the average, intensive fishing in that area accounted for 40 percent of the total effort expended in the north-central Gulf between June and November.

Part A of figure 9 compares the average relative abundance for all bottomfish species, and for croaker, in tons per hour, from 1959 through 1962. Minimum values for all species and for croaker are evident in March. A twofold increase takes place by June followed by a decreasing trend through November, and increasing again in December. Obviously the croaker governs the seasonal variation in the overall relative abundance of the bottomfish resource.

Part B of figure 9 reveals that the average depth fished by trawlers in February is 12 fathoms, while shallower depths of 5 to 6 fathoms are fished from June through October.

In Part C of figure 9 it is evident that the average tow takes $2\frac{2}{3}$ hours in March, while shorter tows of about $1\frac{1}{2}$ hours each are made in June, July, and August. Most apparent from those data is that the evident change in bottomfish abundance from spring to summer is largely due to a real increase in the croaker yield on the nearshore grounds.

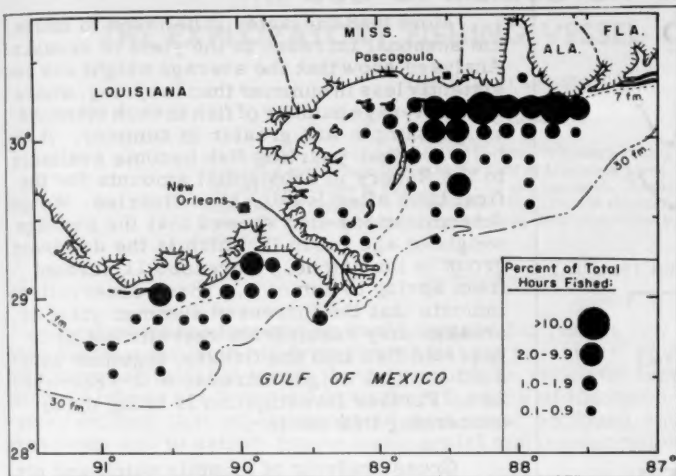


Fig. 7 - Distribution of fishing effort in the industrial bottomfish fishery, December-May 1959-62.

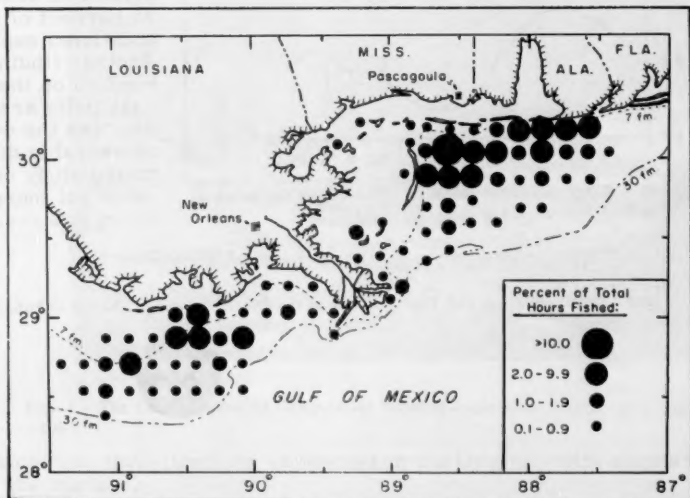


Fig. 8 - Distribution of fishing effort in the industrial bottomfish fishery, June-November 1959-62.

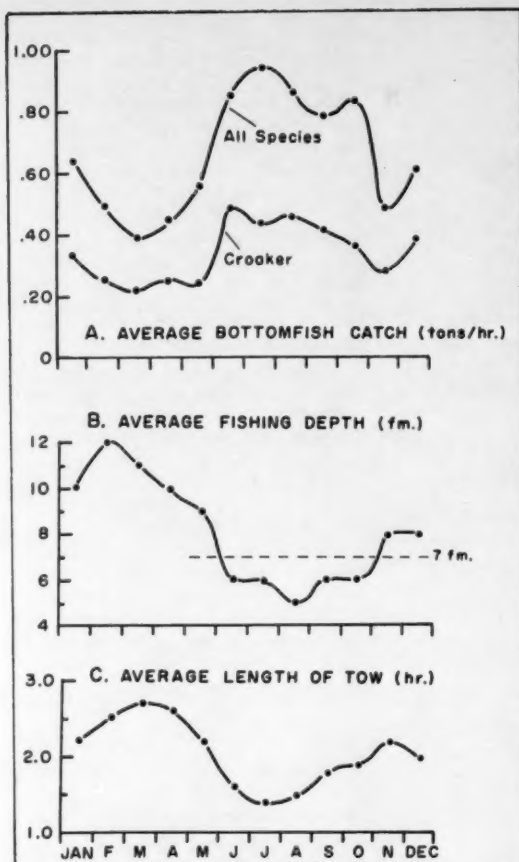


Fig. 9 - Catch and effort statistics, 1959-62, in the industrial bottomfish fishery.

GENERAL OBSERVATIONS ON CROAKER

More than one factor is believed to cause the seasonal increase in the yield of croaker. Analyses show that the average weight was consistently less in summer than in spring, whereas the average number of fish in each standard-weight sample was greater in summer. It is believed that yearling fish become available to the fishery in substantial amounts for the first time after leaving the estuaries. Weight determinations also showed that the average weight of age group II, which is the dominant group in the catches, increased 21 percent from spring to summer. These observations indicate that the increased summer yield of croaker may result from recruitment of 1-year-old fish into the fishery, together with a substantial weight increase of 2-year-old fish. Further investigation is being made concerning this matter.

Gross analysis of monthly catch and effort statistics for the Gulf bottomfish fishery has been completed for the period 1959 through 1962. The mean relative abundance of bottomfish, using catch per hour as an index, was almost identical for both the east and west Delta grounds. Since effort expended in west Delta waters averaged only 25 percent of the overall northern Gulf total, additional exploitation there is indicated. Another finding is that the abundance of bottomfish on the heavily fished grounds of the east Delta area remained almost the same, whereas the overall trend in catch increased measurably during the 4-year period. Continued study of the fishery will reveal whether or not increasing catches have begun to harm this resource potential.

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Created in 1849, the Department of the Interior—a department of conservation—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

SUMMARY OF TUNA OBSERVATIONS IN THE GULF OF MEXICO ON CRUISES OF THE EXPLORATORY FISHING VESSEL OREGON, 1950-63

By Tomio Iwamoto*

ABSTRACT

A resume of work done on tuna by the exploratory fishing vessel Oregon during 14 years of exploratory fishing in the Gulf of Mexico is given. Prospects for commercial exploitation of tuna in the Gulf are discussed. Surface observations of tuna logged on the Oregon are summarized. Blackfin and skipjack tuna are the tuna most frequently found at the surface in the Gulf; their abundance indicates a commercial potential.

INTRODUCTION

Because of the increasing world demand for tuna, a few restricted populations of that fish have become subjected to tremendous fishing pressures which may exceed the limits for a maximum sustainable yield. In the case of the yellowfin tuna in the tropical eastern Pacific, efforts already are being made to limit the size of the catch on an international basis. It becomes evident that other stocks of tuna must be found and harvested to distribute fishing pressures and to satisfy future commercial and conservation needs.

The Gulf of Mexico has long been a source of wealth in terms of shrimp, snapper, menhaden, oyster, and many other marine products. Explorations by the U. S. Bureau of Commercial Fisheries research vessel Oregon indicate the existence of potentially commercial stocks of offshore tuna in the Gulf.

The potential for a long-line fishery in the Gulf of Mexico and Caribbean Sea for deep-dwelling yellowfin tuna has already been reported by Bullis and Captiva 1955 and Wathne 1959. Information obtained on the R/V Oregon indicates an excellent potential for exploiting surface-occurring schools of tuna in the Gulf; however, specific data on surface occurrences of tuna in that region have not been published.

The purpose of this report is to summarize the Gulf of Mexico tuna investigations conducted on the Oregon, with emphasis on the occurrence of tuna at the surface.

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Fig. 1 - The U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

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BACKGROUND

EARLY TUNA SIGHTINGS: In 1950, the Fish and Wildlife Service began an exploratory fishing program in the Gulf of Mexico with the motor vessel Oregon. From the beginning of the program, tuna schools were sighted from the Oregon in large numbers. Scattered reports by merchant vessels and tugs also indicated that sizable populations of tuna were present.



Fig. 2 - A blackfin tuna caught on a trolling jig is hoisted aboard the Oregon. Trolling lines are set out during all daylight running hours.

Occasional troll captures by the Oregon showed the schools to be composed of yellowfin (*Thunnus albacares*), blackfin (*T. atlanticus*), and skipjack tuna (*Katsuwonus pelamis*). During September 1951, Bullis (1955) reported sighting 9 schools of blackfin in 1 day off Mississippi and Louisiana, with the schools averaging an estimated 100-500 tons each. Through the years similar sightings of tuna schools have been made by Oregon personnel. The report for Oregon cruise 24 in the northeast Gulf states: "Observations of surfacing tuna paralleled those made in preceding years during the summer months. Schools of blackfin, yellowfin, and white skipjack, sometimes mixed together, were seen every day during the trip" (Springer 1954).

EARLY FISHING ATTEMPTS:

Purse Seine: A few attempts at purse seining were made during 1952 with linen nets. The results of the few sets

made from the Oregon with this gear are inconclusive. The weather was highly unfavorable during this time, and the tuna schools were wild and not in a good condition for seining. Purse seining for tuna, other than bluefin, was a relatively new innovation at the time the trials were made, and the revolution resulting from the development of the nylon net and power block that ultimately saw the mass conversion of the California clipper fleet in 1959, 1960, and 1961, was still in the infant stage (McNeely 1961).

Live-Bait: In 1953 an attempt was made at live-bait fishing, a method that was predominant in the tuna fisheries at that time. The Oregon was ideally suited to this method, for it was a tuna clipper specifically designed for the West Coast live-bait tuna fisheries. Results of the live-bait trials were summarily poor. Live bait was plentiful and easily caught in the Gulf (Siebenaler 1953). Surface schools were readily found and could be attracted to the vessel with live-bait chum and spray from the fire hose. The tuna could not,

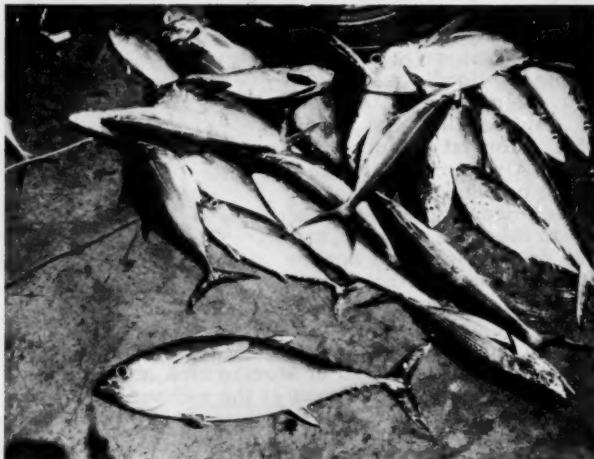


Fig. 3 - A mixed catch by the Oregon of troll-caught blackfin tuna (*Thunnus atlanticus*), little tuna (*Euthynnus alletteratus*) and rainbow runners (*Elagatis bipinnulatus*).

however, be held at the stern of the vessel long enough for satisfactory catches to be made.

Long Lines: Preliminary results of fishing Japanese long lines in early 1954 showed this to be an effective method for harvesting the deeper running tunas, notably the yellowfin tuna (*Thunnus albacares*). After 1954, fisheries personnel at Pascagoula emphasized the use of long-line fishing.

TUNA LONG-LINE OPERATIONS: Areas of Tuna Concentrations: OFF THE MISSISSIPPI RIVER: During the early exploratory phase of the tuna long-lining program, two areas with notable concentrations of subsurface tuna were discovered. One area was the northern Gulf of Mexico off the Mississippi River delta along the 1,000-fathom curve. Yellowfin were found during every month in that area although they were present in commercial quantities only from July through December. An interesting find was large bluefin tuna (*Thunnus thynnus*) in the 300- to 700-pound class during March and April. Those large fish caused much damage and loss of gear. Because a market for them did not exist at the time, commercial ventures for the large bluefin were not deemed feasible.

CAMPECHE GULF: Another area was found in the Gulf of Campeche where yellowfin were apparently present in commercial quantities during all seasons. That area extends northward through the middle Gulf and intergrades with the first area. The two areas were fished on a commercial scale with long lines during three cruises of the *Oregon* in 1955 and 1956. The average catch rates for the three cruises were 5.0, 4.4, and 4.5 yellowfin per 100 hooks, with individual station highs up to 12.9 yellowfin per 100 hooks (Wathne 1959). The yellowfin caught in the Gulf of Mexico averaged over 100 pounds apiece; most of the first were between 60-150 pounds (Bullis 1955).

Commercial Long-Line Ventures: EARLY ATTEMPTS: During the years that the *Oregon* made tuna long-line investigations, several boats were converted to fish that gear in the Gulf. Catch rates of a few of the vessels indicated a good potential, although the operators were fishing far less gear than they were capable of and were generally disregarding much of the proven methodology recommended by Bureau personnel. Unfortunately, the lack of a suitable local market for tuna made the venture unprofitable because storage of catch and cost of transshipment to Puerto Rican or West Coast canneries proved prohibitive.

PRESENT STATUS: Since 1958, United States fishermen have done very little with Gulf of Mexico tuna. No American vessels are now known to fish tuna commercially in the Gulf. The Japanese are known to have recently made several sizable tuna long-line cruises, possibly on a seasonal basis, in the southwest Gulf. Firm catch figures are not available, but catch rates are rumored to have been high. The Cuban live-bait tuna fishery, operating since 1940, is still believed to be in existence. This fishery is based in the northern section of Cuba and operates quite close to shore. The catch, comprised of small blackfin and skipjack tuna, averaging 3-4 pounds, is canned and consumed domestically (Rawlings 1953).

PRESENT PROSPECTS FOR A GULF TUNA FISHERY

LONG-LINE METHOD: The long line is now the only available commercial gear used for harvesting deep-dwelling tuna (Bureau of Commercial Fisheries 1963). That gear has serious limitations, however, because its manpower requirements are quite high. In a society, such as Japan's, where labor costs are low, the long-line method is economically feasible. The rapid rise in the last decade in Japanese tuna production can be attributed to the use of the long line. The method dominates their tuna fleet to this day. To the United States fisherman, the high cost of labor may make the difference between a commercially feasible venture and an unprofitable one; thus, the use of long lines for tuna remains marginal in this country today. It is now being used to a limited degree in the East Coast tuna fishery where swordfish long liners seasonally switch to tuna to supplement their incomes. The economic problems involved in using that method in the Gulf of Mexico fishery remain unsolved. Under present conditions, other gear fishing surface tuna appear to hold greater promise.

PURSE-SEINE METHOD: Because of economic difficulties due to increased foreign competition and lowered market prices for tuna in the 1950's, the United States tuna industry was forced to look for improved methods to reduce the cost of its operations. The nylon purse seine and the power block proved to be the answer to the industry. This strong and easily handled gear made possible huge catches of entire tuna schools. Single sets of over 20 tons of fish are common in the Eastern Pacific tuna fishery. The substantial increase in fish-per-man-days at sea resulting from the use of the purse seine offset the initial high cost of the conversion to this gear.

The change of the fleet from predominantly bait vessels to primarily purse-seine vessels took place at a rapid pace in the late 1950's, reaching a peak in 1960 (McNeely 1961). Since then, purse seiners have been the paramount producers of tuna in the United States fleet. In 1962, 139 purse seiners were reported operating out of United States ports, including Puerto Rico, compared with 36 bait vessels (Schaefer 1963). Predictions are that bait vessels will have only limited use in the United States tuna fleet unless radical improvements are made toward obtaining greater efficiency. In the foreseeable future the purse-seine vessel will continue to dominate the United States tuna fleet.

SURFACE-SCHOOLING TUNA OFFER BEST COMMERCIAL POTENTIAL: The prospects for harvesting surface-occurring tuna in the Gulf of Mexico with purse seines appear quite favorable. This outlook is based mainly upon the fact that great numbers of large schools of tuna, predominantly of two species, the blackfin tuna and the skipjack, were sighted throughout the Gulf during the *Oregon's* exploratory fishing. Those two species are often found mixed together in large dense schools and take trolled lures quite readily. The incidences of *Oregon* troll captures of blackfin are quite small, however, because the trolled hooks are easily torn out of their delicate mouths. Also, the *Oregon* cruises too fast for trolling to be very effective.

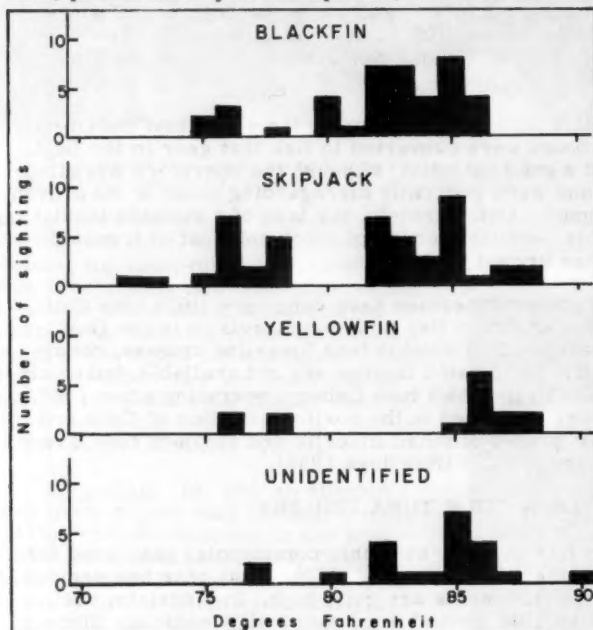


Fig. 4 - Relation of surface temperature to number of surface tuna sightings in the Gulf of Mexico.

BLACKFIN TUNA: The blackfin (*Thunnus atlanticus*) is confined to the western Atlantic and ranges from Rio de Janeiro, Brazil, to southern New England (Mather and Day 1954). It is not known to be caught commercially anywhere except in Cuba. It is rarely caught on long lines although sets using that gear have been made in areas where blackfin were quite abundant on the surface. Indications are that the species generally remains in the upper mixed layers of the ocean and is not a deep swimmer.

Blackfin tuna have several characteristics that are advantageous to commercial exploitation by purse-seine methods:

1. They are frequently found in large dense schools, and thus are easily captured by purse seines.
2. They tend to remain near the surface in the mixed layer and are often sighted feeding on the surface; this is, of course, a prime requisite as the purse seines are set on the sur-

face by sight, and not blind as are long lines and some types of nets. Surface activity by the tuna makes them more susceptible to direct detection or to indirect detection by the presence of bird flocks.

3. Their relatively small size, less than 25 pounds, is desirable because of the ease of handling them, both on the fishing vessel and in the cannery. (Blackfin tuna caught by the R/V *Oregon* averaged about 9 pounds--ranged 2-25 pounds.)

4. Blackfin are an excellent food fish and can be packed as a lightmeat tuna, giving them a high potential market value.

SKIPJACK TUNA: The skipjack tuna (*Katsuwonus pelamis*) is a cosmopolitan oceanic species thought to be the most abundant tuna in the world. Next to the yellowfin tuna, it comprises the largest portion of the tuna catch brought into United States ports. The catch of that fish is increasing annually, and it seems probable that skipjack will eventually dominate the tuna catch. This future dominance becomes especially apparent when one considers the Eastern Pacific tuna fisheries in which the yellowfin stocks are being overexploited while the skipjack stocks are barely being touched (Inter-American Tropical Tuna Commission 1963).

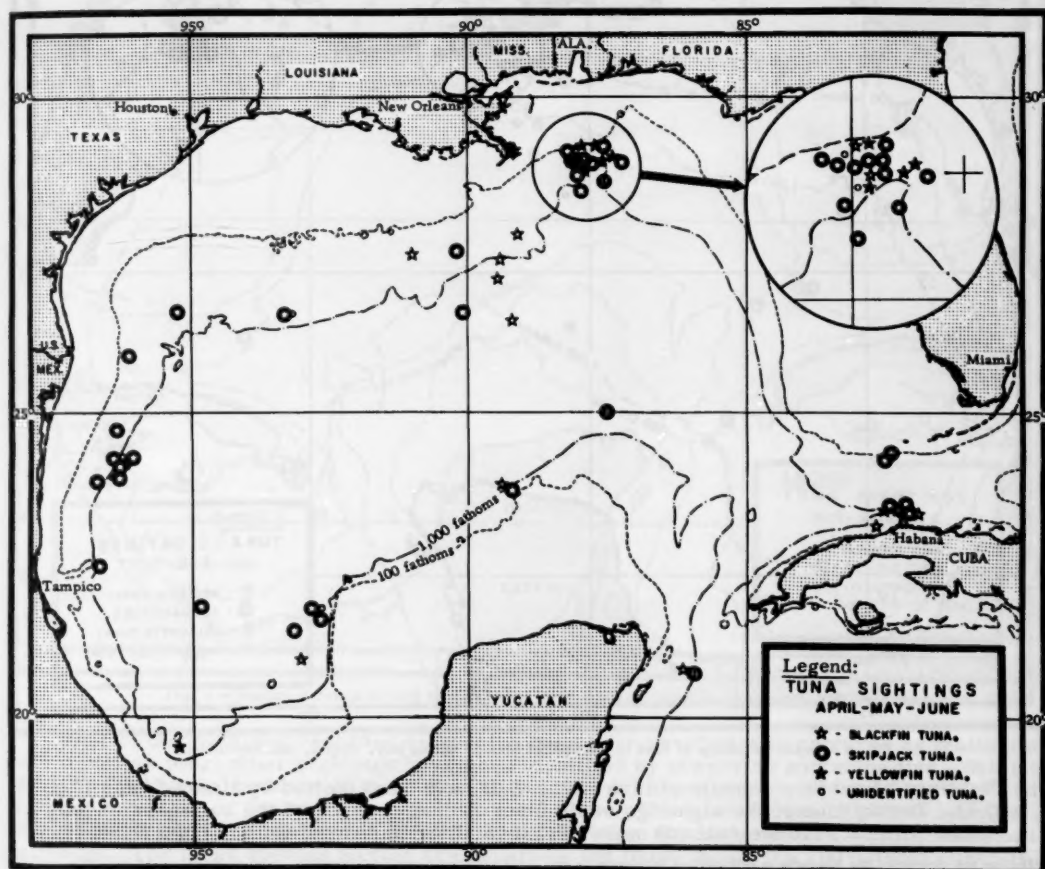


Fig. 5 - Surface sightings of tuna in the Gulf of Mexico during April, May, and June.

The skipjack's habits are similar to the blackfin's, and its marketable value is already proven. The average weight of the skipjack caught from the Oregon in the Gulf was 11 pounds--ranged 3-30 pounds. Surface-school sightings in the Gulf indicate the skipjack may be present in quantities just slightly below the blackfin population. Of the sightings recorded, 34 percent were identified as skipjack, whereas 36 percent were identified as blackfin.^{1/}

OCCURRENCE DATA: Surface tuna schools have been found throughout the year in the southern Gulf but rarely in the northern Gulf from January through March. Surface schools have been found most abundant during summer and fall when the surface water temperature climbs above 75° F. (fig. 4). Although sightings of yellowfin and bluefin tuna have been recorded on the surface in the Gulf, their recorded occurrences there are fragmentary and never in the large quantities reported for blackfin and skipjack.

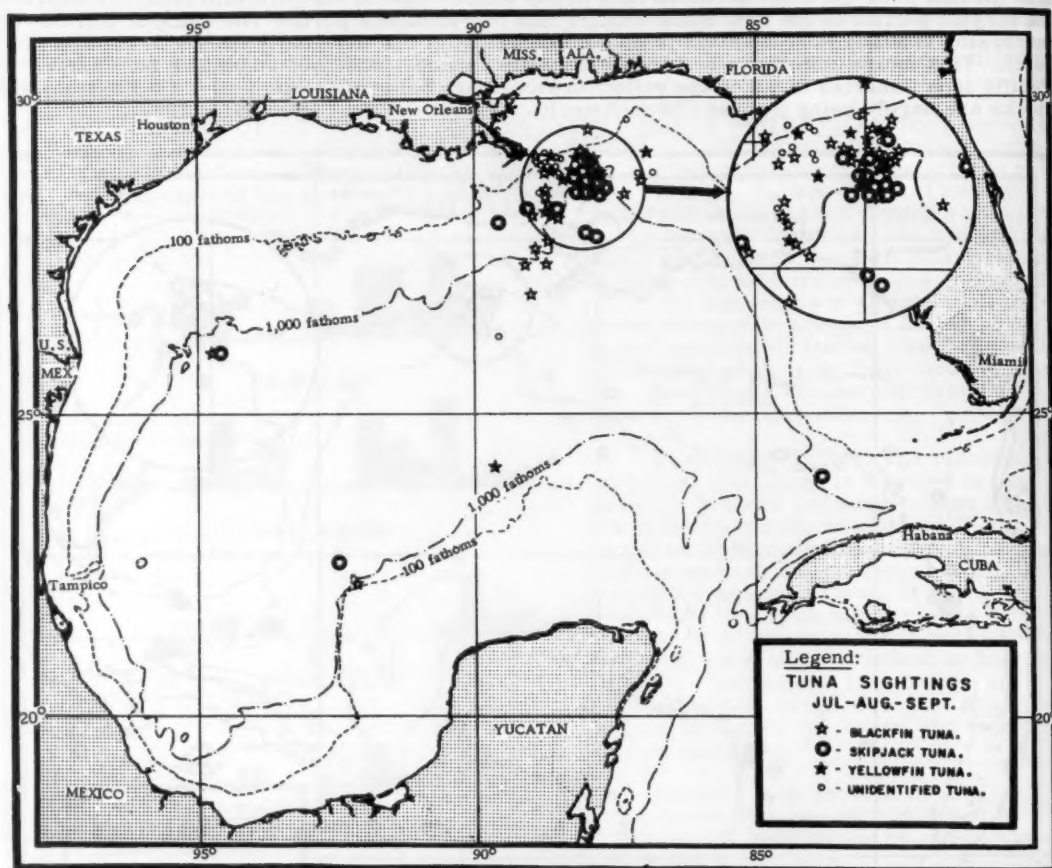


Fig. 6 - Surface sightings of tuna in the Gulf of Mexico during July, August, and September.

Sightings of surface schools of tuna in the Gulf have been plotted by time of year (figs. 5, 6, and 7). Twenty-one of the sightings come from station records of the commercial long-line vessel Milmar. Those records were kept by a U. S. Bureau of Commercial Fisheries

^{1/}Unlike the skipjack, the blackfin is difficult to recognize in the field without captures; therefore, actual sightings of blackfin are undoubtedly greater than the 36 percent would indicate. The greater share of the unidentified sightings (which compose 17 percent of the total reported here) are thought to be blackfin schools.

observer during three of the vessel's cruises in April, May, and June 1958. All other sightings come from station logs of the R/V Oregon. The only species of tuna shown in the figures are the three that constitute the tuna with the greatest commercial potential in the Gulf. Although little tuna (Euthynnus alleteratus) are frequently found in large numbers, their commercial value is less than marginal (Chilton 1949). The albacore (Thunnus alalunga) and the big-eyed tuna (T. obesus) have not been reported from the Gulf. Since blackfin and skipjack tuna are most frequently found on or near the surface, long-line capture records have been plotted when no surface activity was evident in the area at the time of capture. Incidences of their capture with this gear are not numerous. During January, February, and March, tuna sightings have numbered less than a dozen and are, therefore, not shown.

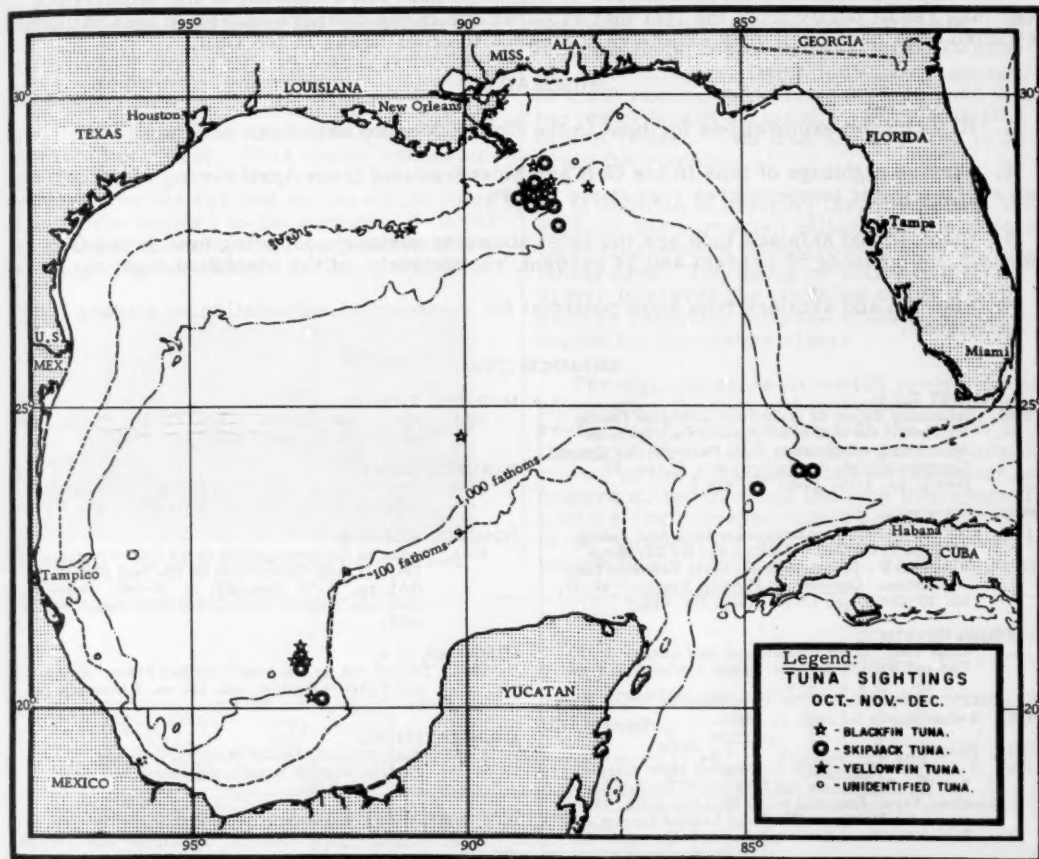


Fig. 7 - Surface sightings of tuna in the Gulf of Mexico during October, November, and December.

Most of the sightings recorded by species have been verified with captures by trolling or pole-and-line gear; other sightings have been identified by observing surfacing fish. Skipjack and large yellowfin, because of their distinctive external appearances, are readily identified if they jump clear of the water and are observed close. The blackfin is difficult to identify without being captured because it may easily be mistaken for little tuna or small bluefin or yellowfin. The three species plotted are generally not found inside the 100-fathom curve in

the Gulf of Mexico.^{2/} Nearly all of the tuna schools identified by captures inside the 100-fathom curve were composed of the little tuna; unidentified tuna schools in those depths have, therefore, not been plotted although there are large numbers of records for such sightings.

The sightings recorded here are but a small portion of those actually made. Many of the sightings were made during the course of other work on the Oregon and recorded as secondary observations. Frequently surface schools of fish that are sighted cannot be investigated because time is limited or because the vessel is engaged in other activities (e.g., trawling or dredging) which preclude any immediate investigations.

The disproportionately large numbers of sightings east and southeast of the Mississippi River may result partly from the fact that explorations in the offshore waters in that rather restricted area have been very extensive compared to other areas in the Gulf.

SUMMARY

1. R/V Oregon explorations for tuna in the Gulf of Mexico have been summarized.
2. Surface sightings of tuna in the Gulf are most frequent from April through December when surface water temperatures rise above 75° F.
3. Blackfin and skipjack tuna are the most abundant surface-occurring tuna in the Gulf of Mexico, comprising 36 percent and 34 percent, respectively, of the identified sightings.
4. Blackfin and skipjack tuna show potential for commercial exploitation by surface fishing techniques.

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^{2/}Along the Atlantic coast, the blackfin is most frequently found inside the 100-fathom curve (Mather 1962). Oregon records indicate the opposite to be true in the Gulf of Mexico.

TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 15--AIRLIFT FOR HARVESTING OYSTERS:

A new machine for harvesting oysters has been developed by the Olympia Oyster Company, Shelton, Wash. This oyster harvester uses high-pressure water jets to loosen the oysters from the sea bed and an airlift pump to bring the oysters to the surface. A patent is pending on this machine (components of the new harvester are shown in figs. 1 and 2).

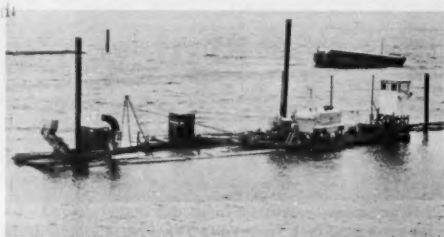


Fig. 1 - The airlift oyster harvester tied to the dock.

recovers almost all oysters in its path, even on dense beds, and can harvest up to 100 bushels in 10 minutes. David McMillan, manager of the Olympia Oyster Company, designed the harvester to operate in calm waters at depths of 8 to 16 feet. Two men are required to operate the machine.

In addition to bringing large oysters to the surface, the harvester collects and transfers immature oysters from growing beds to fattening beds. The designer believes the harvester improves the condition of the oyster beds by removing silt, and could be easily adapted for harvesting clams.

The high-pressure jet-airlift system takes effect after the forward movement of the harvester has forced oysters into the mouth of the airlift duct. Air, which is pumped into the bottom of the duct, rises and forces water and oysters up the duct and onto the conveyor. The oysters are conveyed onto a barge. The depth of the mouth of the airlift duct is controlled by hollow floats into which water or air is pump-

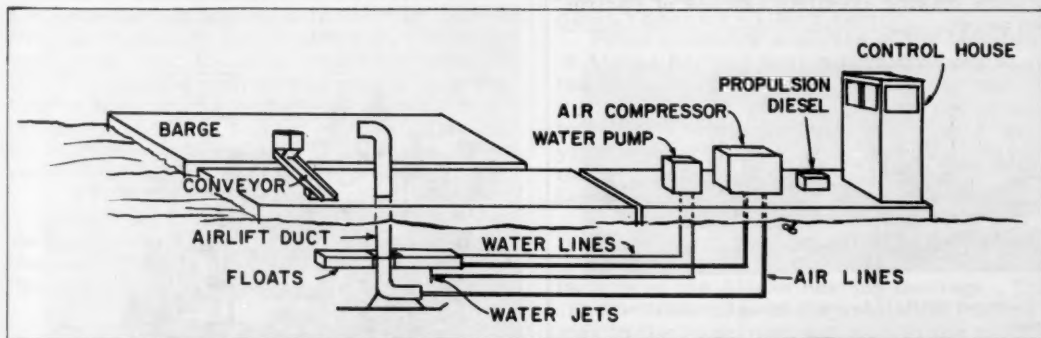


Fig. 2 - A schematic diagram of the airlift oyster harvester showing all the major components.

Depending on bottom conditions, this machine efficiently harvests oysters from a 3-foot-wide swath at speeds ranging from $\frac{1}{2}$ to 3 miles an hour. The harvester reportedly

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ed. The outer shell of the duct slides like a telescope to adjust for varying water depth.

The high-pressure water jets are not always needed and are used only on beds that have heavy oyster concentrations or are heavily silted. A propulsion Diesel engine with an outboard attachment moves the harvester over the oyster beds. Controls mounted in the control house provide for steering the harvester and include devices for adjusting the depth of the mouth of the airlift duct and the quantity of air flowing into the airlift duct.

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Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, OCTOBER 1964:

U. S. S. R.: The Soviets maintained a trawling fleet in the Gulf of Alaska throughout October, although its size continued to diminish. By the end of October it was estimated the fleet numbered less than 20 vessels consisting of about 10 to 12 trawlers, 4 reefers, and a few support vessels. During the month the fleet again concentrated on the Continental Shelf edge about 40 miles southwest of Yakutat Bay, an area the Soviets fished heavily in the spring of 1964. Intermittent observations from surface and aerial patrol units indicated they were making excellent catches of Pacific ocean perch.



Fig. 1 - Soviet trawler under way in Bering Sea with all nets aboard.

There were indications that the Soviets had resumed their shrimp fishery in the eastern Bering Sea, presumably in the vicinity of the Pribilof Islands. In late September two trawlers were reportedly dispatched to resume that

fishery, which was started early in the spring of 1964 but came to an end by early June.

There were no sightings of Soviet whaling vessels in the Alaskan area and it was believed their whaling efforts in the North Pacific were over for the year.

Japan: Withdrawal of nearly all Japanese fisheries off Alaska was to be completed by the end of October. The vessel Chichibu Maru, accompanied by 12 trawlers, was licensed by the Japanese to fish throughout the year, primarily for shrimp. Last reports were that the fleet was still operating generally north of the Pribilof Islands, and was expected to continue fishing for shrimp until the end of 1964.

The factory trawler Daishin Maru No. 15 terminated her "exploratory" operations in the Gulf of Alaska and sailed for Japan about



Fig. 2 - Japanese king crab factoryship Tokei Maru. Most of the production consists of canned king crab meat.



Fig. 3 - Small runner boat attached to Tokei Maru.

the middle of October. Of the other 5 trawlers similarly licensed for the Gulf, only the factory trawler Taiyo Maru No. 77 was seen during the month. She was fishing near Portlock Bank east of Kodiak at the time. Licenses issued the 6 "exploratory" vessels for Gulf of Alaska operations reportedly expired October 31, 1964, and they were presumed to have terminated their fishing in the Gulf.

The Tokei Maru and Tainichi Maru king crab fleets, which have consistently fished in the area north of Port Moller, reportedly filled their catch quotas totaling 235,000 cases and left for Japan by late September.



Fig. 4 - Gyokuei Maru fish-meal factoryship operating north and west of the Pribilofs.

Four of the Japanese fish-meal fleets returned to the Alaskan area for a short period from the middle to late September. The Gyokuei Maru, Soyo Maru, and Hoyo Maru fleets operated generally north and west of the Pribilofs, while the Tenyo Maru fleet fished between Unimak Pass and the Pribilof Islands. All of those fleets had left for Japan by the end of September.

None of the 3 Japanese whaling fleets previously seen operating in the vicinity of the Shumagin Islands westward along the Aleutian Chain were sighted during October.

JAPANESE BERING SEA BOTTOMFISH CATCHES:

A report of a study by the Japan Northern Waters Bottomfish Mothership Council revealed that the total catch of the 14 bottomfish fleets operating in 1964 in the eastern

and western Bering Sea far exceeded the 1963 catch. As of September 20, 1964, it was announced that the catches of those fleets totaled 394,000 metric tons, as compared to 311,000 tons in 1963. Alaska pollock 117,000 tons, flatfish 88,000 tons, herring 42,000 tons, and rockfish 38,000 tons led the landings. Catches of halibut (2,000 tons) and sablefish (6,000 tons) were poor as compared to previous years.

KING CRAB HARVEST AT KODIAK AND WESTWARD:

Because the king crab harvest in the Kodiak area remained at a low level during October 1964 due to lack of facilities after the earthquake, only 14 tagged crabs were caught by commercial fishermen. A year earlier during October, over 200 tagged crab were taken. The commercial harvest of king crab west of Kodiak Island continued at a higher level than in previous years. Processing plants in the Shumagin Islands area operated at near-capacity. A new plant at Cold Bay began processing king crabs using an operation considered unique for a plant located so far westward. The crabs are cooked, cooled, and shipped by air to markets in other States where they are sold as fresh crab meat. Other processors in the area pack frozen or canned products.

HERRING CATCH FLUCTUATIONS ANALYZED BY COMPUTER:

From computer analyses of the landings of Alaska herring over a period of years, it has been determined that the fluctuations in the catches have not always been due to fluctuations in year-class strength. The analyses cover the years 1929 to 1962 for southeast Alaska, 1937 to 1958 for Prince William Sound, and 1936 to 1959 for Kodiak Island.

With year-class fluctuations discounted, it is possible to assess the effects of other factors on the Alaska herring landings. The annual differences in the availability of herring to the fishermen and also in the catchability of herring by the fishing fleet are two important factors. In addition, there are variations in natural and fishing mortality that may contribute to fluctuations in the catches.

A plan for determining the role of fishing mortality in the seasonal fluctuations in Alaska herring landings is under study at the U.S. Bureau of Commercial Fisheries Biological Laboratory at Stanford, Calif.



Alaska Fishery Investigations

STUDIES ON PINK SALMON MIGRATIONS:

Extensive observations on juvenile pink salmon in Southeast Alaska were made by a biologist of the U.S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, using the Bureau's research vessels Heron and Blue Boat. In the course of the studies a rendezvous was held with the Fisheries Research Institute vessel Commander working on offshore aspects of the same problem. Although the major migration of juvenile pink salmon into the Gulf from northern Southeastern Alaska in 1964 appeared to be south through Chatham Strait (and not through Icy Strait), many tagging experiments on adult pink salmon in past years have clearly demonstrated that the largest adult spawning runs enter northern Southeastern Alaska through Icy Strait. If juvenile salmon migrations in 1964 are characteristic of other years, an important discovery has been made bearing on salmon homing--the juveniles may be leaving coastal waters by one route and the adults returning to spawn by an entirely different route. This would eliminate the possibility of "retracing their steps" by memory.

SEA WATER MAY ACCELERATE DEVELOPMENT OF PINK SALMON EMBRYOS:

Pink salmon eggs in the Bureau's Auke Bay Biological Laboratory exposed to simulated intertidal incubation conditions at the age of 2 weeks showed a significantly greater embryo head development than eggs exposed to fresh water. The intertidal simulation was obtained by introducing the sea water 4 hours every 12 hours. The results are still inconclusive, but the exposures to sea water caused no mortalities and resulted in slight acceleration in embryo development.

SALMON SPAWNING BEDS

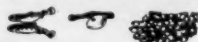
UNSTABLE AFTER EARTHQUAKE:

Field work by the U.S. Bureau of Commercial Fisheries on 4 streams being studied in

the Prince William Sound area show that stream bed adjustments as a result of the changes in land elevations following the earthquake are still occurring. Some spawning beds are stranded as new channels are formed during freshets. The behavior of the 1964 Prince William Sound pink salmon spawning migration, the first season after the earthquake, indicates no radical change in spawning behavior despite altered environments. Streams in uplifted areas have not yet reached equilibrium and are shifting their channels. New channel formation may account for some apparently low egg deposition. Uplift has brought former poor intertidal areas up to productive tide levels. But stream flow and digging by spawning salmon have not been sufficient to remove fines from these areas in all streams. In uplifted O'Brien Creek egg deposition was quite high but showed a reduction of live egg abundance from 163 per 0.1 square meter of stream bed to only 68 eggs just previous to hatching.

KARLUK RED SALMON RUN INCREASES IN 1964:

An estimated 538,000 red salmon escaped into the Karluk system. A substantial bimodal fall run boosted the 1964 escapement to the second highest in 11 years. The average escapement since 1955 has been about 344,000 fish. The commercial catch for the Karluk district was 213,000 bringing the total run for 1964 to 751,000. An egg mortality study in the Grassy Point Creek tributary to Karluk Lake revealed an 8.8 million egg loss of the 10.5 million egg potential. The loss can not be explained by bear predation and will be investigated further. Since 1961, older smolts have become more numerous in the Karluk outmigration. The present dominant 3-plus age group constituted 66 percent of the 1964 outmigration. The 3-plus age group comprised only 6 percent of the 1961 outmigration. The significance of this shift in age group is not clear, but a similar change has also occurred in Bristol Bay runs.



American Samoa

TUNA PRICES:

The following prices for tuna delivered to the United States processing plants in American Samoa were agreed upon for November 1964 following negotiations conducted be-

tween Japanese trading firms and the United States packers located on that Island:

Species		US\$/short ton
Albacore	(iced)	310
"	clipper (froz.)	325
Yellowfin	(frozen)	285
Big-eyed	under 90 lbs. (frozen)	275

Note: The albacore are fish over 45 pounds and the yellowfin and big-eyed are gilled-and-gutted fish.

Source: Suisan Keizai Shimbun, November 8, 1964.

JAPANESE TUNA VESSEL OPERATORS SEEK USE OF LARGER VESSELS:

The Japanese Overseas Tuna Fishery Co-operative Association (formed by vessel owners affiliated with a particular Japanese fishing firm), Japan, is seeking a change in the Japanese Government size restrictions on Samoan-based tuna vessels, from the present 180-gross ton limit to 240 gross tons. The Association members maintain that, despite the higher hook catch rate achieved in 1964 in the South Pacific as compared with 1963, the Japanese tuna fleet in American Samoa is dwindling because vessels under 180 gross tons cannot operate profitably due to the high costs of fuel and other supplies at that base. Moreover, they point out that the remarkable growth of the Korean fishing fleet in American Samoa and the resultant intensification of competition on the fishing grounds with Japanese vessels have dampened the enthusiasm of Japanese fishing crews to fish out of Samoa. To overcome these management problems and to increase operating efficiency, they are urging the Government to make special provisions permitting larger vessels to operate from that base.

The Government is not likely to act readily on this proposal since it feels that consideration should also be given to other matters, such as the condition of resources. (Suisan Keizai Shimbun, October 20, 1964.)



Cans--Shipments for Fishery Products, January-August 1965

A total of 1,918,909 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-August 1964, a decrease of 9.2 percent from

the 2,114,241 base boxes used during the same period in 1963. The decline is due partially to a drop in the canning of jack mackerel and Maine sardines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.



Caribbean and Tropical Atlantic

FISHERY RESOURCE SURVEY CONTINUED:

M/V "Oregon" Cruise 94 (August 24-October 8, 1964): This 45-day cruise in the eastern Caribbean Sea by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon was the first in a series conducted in cooperation with the United Nations Special Fund Caribbean Fisheries Project. The cruise was also a continuation of the general Caribbean and Tropical Atlantic faunal survey and fishery resource evaluation started by the Bureau in 1957.

Preliminary survey coverage during the cruise was obtained in the general area of the Lesser Antilles and between Barbados and Aves Island. Fishing emphasis was placed on pelagic species using surface gear. Where



Fig. 1 - M/V Oregon docked at Fort-de-France, Martinique, in September 1964. This was one of the port calls made during cruise 94.

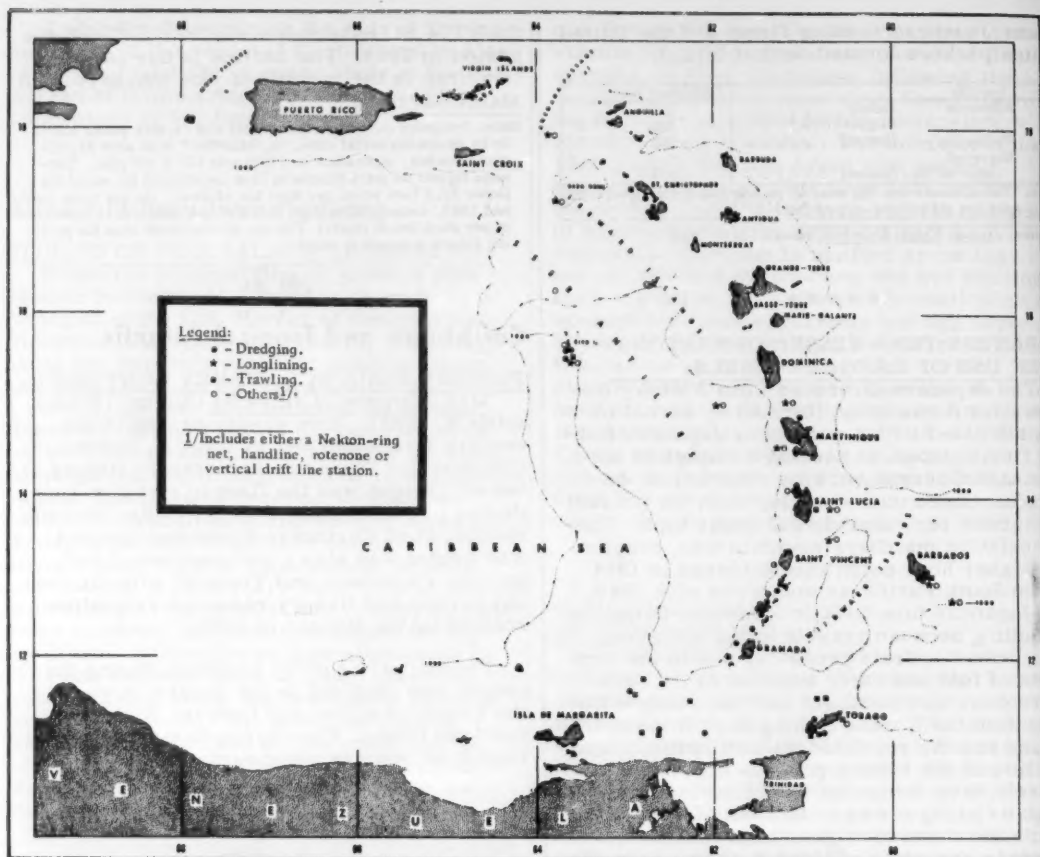


Fig. 2 - Areas investigated during Cruise 94 of the M/V Oregon, August 24-October 8, 1964.

possible, bottom fauna was explored with trawls and dredges. United Nations observers and trainees from various participating countries were aboard the vessel for different phases of the cruise.

Day and night long-line sets (500-600 hooks) were made at 11 localities in the survey area. Tuna catches were very poor. A few yellowfin (*Thunnus albacares*) and blackfin (*T. atlanticus*) were caught south of Saba Bank and east of St. Vincent Island, and two broadbill swordfish (*Xiphias gladius*) were caught on a night set north of Aves Island. Catches at the other long-line stations included small numbers of different shark species: white-tip (*Pterolamiops longimanus*), silky (*Carcharhinus falciformis*), blue (*Prionace glauca*), blacktip (*C. limbatus*), bigeye thresher (*Alopias superciliosus*), and mako (*Isurus oxyrinchus*). Also

taken were 2 oilfish (*Ruvettus pretiosus*), 3 barracuda (*Sphyraena barracuda*), 1 wahoo (*Acanthocybium solandri*), 2 dolphins (*Coryphaena hippurus*), and 3 unidentified gempylids. A total of 20 bathythermograph (BT) casts was made in the long-line fishing areas. Two surface-feeding tuna schools (tentatively identified as blackfin) were observed off the east coast of St. Lucia.

A 1-meter nekton ring net was surface-towed as the long-line gear was set, and the collections were preserved for identification and further study at the Bureau's Biological Laboratory, Brunswick, Ga.

Night-light attraction tests were conducted at 4 stations off Cannouan Island in the Grenadine group. Dwarf herring (*Jenkinsia*) and silversides (*Atherinidae*) were densely at-



Fig. 3 - M/V Oregon's port call to Fort-de-France attracted visitors.

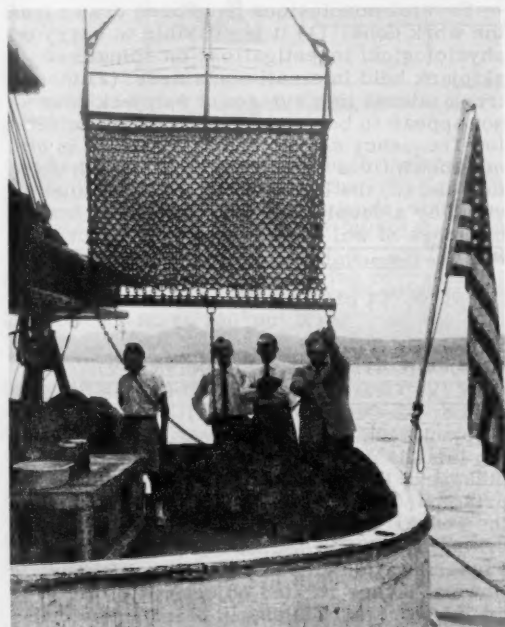


Fig. 4 - Personnel aboard the M/V Oregon explain function of a dredge to Martinique newsmen, while vessel was docked at Fort-de-France.



Fig. 5 - Two fish specimens caught by the M/V Oregon during cruise 94. The specimens had been frozen after being captured and were brought up on deck for showing to the visitors and newsmen while the vessel was at Fort-de-France.

tracted to the light. During one hour, 150 pounds were dip-netted and frozen for use as long-line chum.

Other species caught on trolling lines maintained while steaming between fishing stations were: 1 yellowfin tuna, 9 little tuna (Euthynnus alletteratus), 4 common dolphin, 5 great barracuda, and 1 cero mackerel (Scomberomorus regalis). Length, weight, sex, and stomach contents were recorded for each fish.

A total of 24 trawling and 38 dredging stations was made in the general vicinity of Barbados, Tobago, and Los Testigos and the western side of the Windward and Leeward Islands from Grenada to St. Christopher. Catches of 5 to 45 pounds of 10- to 16-count (heads-off) brown shrimp (Penaeus aztecus) per 60-minute drag with a 40-foot flat trawl were located in a limited area of trawlable bottom in 36 to 48 fathoms off the southwest end of Tobago. In depths ranging from 200 to 340 fathoms north of Tobago, various shrimp species of potential commercial value included red shrimp (Hymenopenaeus robustus, Aristaeus antillensis, and Penaeopsis megalops), scarlet shrimp (Plesiopenaeus edwardsianus, Aristaeomorpha foliacea), and striped shrimp

(*Plesionika longipes*). The best drag (200 to 240 fathoms) yielded 80 pounds of red shrimp of the *P. megalops* species (100 heads-off count), 40 pounds of the *H. robustus* species (26-30 heads-off count) and 10 pounds of lobsterettes (*Nephrops binghami*). In that general depth range, other invertebrates of potential commercial use included several pounds per drag of *Polychaetes sculptus* and *Geryon* and other crabs. Also in that depth range, the catches were dominated by gadi-forme fishes (*Gadidae* and *Macrouridae*) and deepwater apogonids (*Synagrops* sp.).

During the cruise, reef fishes were sampled at Aves and Cannouan Islands. One vertical drift-line station from the surface to 240 fathoms was attempted off St. Vincent, but with negative results. The vessel made port calls in Martinique, Barbados, and Trinidad to embark and debark observers and trainees taking part in the cruise. The vessel returned to its base on St. Simons Island, Ga.

Note: See *Commercial Fisheries Review*, September 1964 p. 22.



Central Pacific Fisheries Investigations

EXPERIMENTS ON TUNA RESPONSE TO OUTSIDE STIMULI:

Measuring the responses of tuna to external stimuli has been of interest for several years to scientists of the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Experiments carried out in the Laboratory's large shoreside tanks have been undertaken to study the responses of skipjack, yellowfin, and little tuna to light, odor, and underwater sound.

In the summer of 1964, new experiments using new methods and techniques were successfully conducted. Two visiting scientists from New York City conducted electrophysiological and neuroanatomical studies of the lateral line system of spinalized skipjack tuna. The method involved immobilizing the fish and supplying it with oxygenated sea water through a plastic tube affixed to its mouth. The experiments were conducted in a small tank filled with sea water.

Electric recording of nerve impulses from the lateral line nerve was carried out successfully on several skipjack. A total of 20

skipjack was successfully immobilized as experimental animals for physiological studies--the first time this has been accomplished. The trunk lateral line system of the skipjack seemed to be very different from the systems possessed by many of the less active species of fish which had been investigated previously. A high sensitivity of the lateral line to low-frequency vibrations demonstrated for other species could not be demonstrated for the skipjack lateral line. The lateral line nerve fibers of skipjack could be made to respond with impulses by stimulating the organ fairly strongly with a flow of water or with a camel hair brush. Many observations of reflex body and fin movements reacting to touch stimuli were made during the work.

Complete dissections and drawing of the body lateral line nerve systems were made. Samples of the nerve at numerous sites were taken and were being prepared for detailed microscopic study. The work shows that the system of that nerve in the tuna possesses some interesting variations from those of other species of fish.

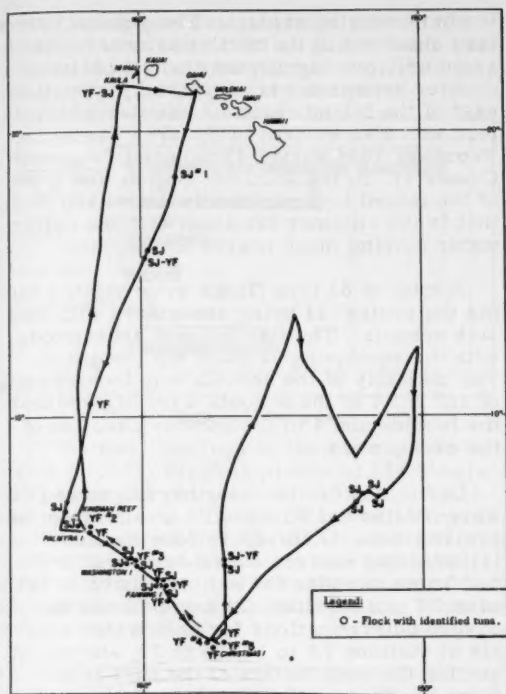
Several conclusions have been drawn from the work done: (1) it is possible to carry out physiological investigations on spinalized skipjack held in small containers; (2) the trunk lateral line system of skipjack does not appear to be used by the fish for detecting low-frequency sounds and its real use is still not known (it is possibly a skin stretch detector; and (3) the lateral line organ is innervated by a deeply lying nerve, the course and branches of which have been traced out.

Note: See *Commercial Fisheries Review*, May 1963 p. 24.

* * * * *

SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 76 (September 22-October 28, 1964): To search for skipjack tuna (aku), which occur in the Hawaiian Islands during the summer and all but disappear during the fall and winter, was the principal objective of this 5-week cruise by the research vessel Charles H. Gilbert, operated by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. Other related objectives of the cruise were to: (1) obtain blood and serum samples from skipjack and evaluate them aboard when possible; (2) maintain a standard watch for bird flocks; and (3) collect oceanographic data of various forms.



Cruise track chart of M/V Charles H. Gilbert, Cruise 76 (September 22 to October 28, 1964).

The research vessel's area of operations during the cruise was among the Line Islands and to an area east of those Islands, roughly 700 miles south of Oahu (about $6^{\circ}30' N.$, $162^{\circ}30' W.$ to approximately $2^{\circ}00' N.$, $157^{\circ}30' W.$ and along the area of converging currents from approximately $8^{\circ}30' N.$ to $13^{\circ}30' N.$ and $158^{\circ}00' W.$ to $150^{\circ}00' W.$

Skipjack tuna populations in the Pacific are divided into a number of reproductively isolated groups called subpopulations. At least two of those groups make up the skipjack catch of the Hawaiian pole-and-line fishing fleet. Those subpopulations can be identified by the fish's blood types using methods which are analogous to methods used to identify blood types such as A, B, AB, and O and the Rh factor in man.

Skipjack encountered during the cruise, both in the Line Islands and in the open ocean, were fished using Hawaiian pole-and-line methods. Fishing was very poor and few samples were obtained. An additional purpose of

the cruise was to examine the blood types of the yellowfin tuna or "ahi," and compare them with the blood types of yellowfin in Hawaii. Yellowfin tuna fishing turned out to be excellent and sufficient numbers were caught to provide excellent samples. The results of the serological studies on those yellowfin suggest that those caught in the Line Islands were from a different subpopulation than those caught off Kaula Island, a small island near Niihau in the Hawaiian chain.

Serological and genetic studies of the skipjack and yellowfin tuna make it apparent that those species are grouped in several reproductively isolated subpopulations. The subpopulations are distributed in a yet to be discovered pattern across the Pacific.

During the cruise, a total of 14 skipjack schools (9 in the Line Islands and 5 in the convergence zone) were sighted but none were caught. Samples from 2 schools (117 skipjack) were obtained within 1 day's run of the Hawaiian Islands. One sample of 65 skipjack bloods and a total of 149 yellowfin bloods were processed on board the vessel. In addition, 30 absorptions were performed.

A total of 17 skipjack schools, 18 yellowfin schools, 2 mixed schools (yellowfin and skipjack), and 14 unidentified schools were observed.

A total of 121 yellowfin blood samples were collected in small vials containing glycerin solution, and 42 large volume yellowfin blood samples were collected in jars of glycerin solution to test the practicality of collecting frozen tuna blood samples. Serum samples of 109 yellowfin were collected. Many oceanographic observations were also made.

Note: See Commercial Fisheries Review, December 1964 p. 35.

TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 9 (October 1-20, 1964): The eighth in a series of oceanographic cruises to determine rates of change in the distribution of properties in the trade wind zone of the central North Pacific Ocean was completed October 20, 1964, by the research vessel Townsend Cromwell. The vessel is operated by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The area of operations was

ever, Chesapeake tuna landings showed a striking increase in 1963 as purse-seine vessels landed 3.1 million pounds of bluefin, skipjack, and yellowfin at Maryland ports.

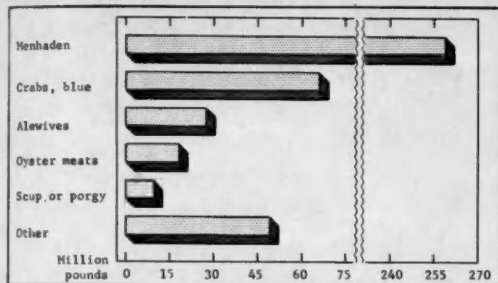


Fig. 1 - Chesapeake States catch, 1963.

Of the total landings in the Chesapeake States in 1963, Virginia produced 374.7 million pounds (87 percent) valued at \$18.7 million (64 percent). The Maryland and Virginia catch was taken by 17,784 fishermen operating 1,274 vessels (craft of 5 net tons and over), 9,495 motor boats, and 888 other boats. The Chesapeake fishery included 65 sailing vessels of 5 net tons and over.

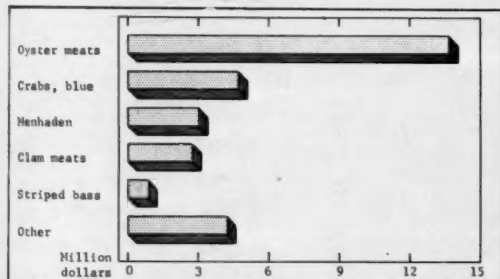


Fig. 2 - Value of Chesapeake States catch, 1963.

Virginia and Maryland produced manufactured fishery products with a total value in 1963 of \$58.2 million at the processors' level—a decrease of \$3.4 million from 1962.



Consumption

PER CAPITA FOOD CONSUMPTION (INCLUDING FISH) INDEX REVISED:

The "Per Capita Food Consumption Index" (includes fishery products) of the U.S. Department of Agriculture has been completely revised. The revised data for selected years

since 1909 were published in Agriculture's National Food Situation, November 1964. Changes in that index include recombining quantities beginning with the year 1955 using retail prices in 1957-59 as index weights, use of marketing loss factors, the addition of Alaska and Hawaii since 1960, the addition of a few new commodities, and alteration of certain commodity groupings.

The per capita food consumption index is a retail-price-weighted quantity index. Average retail prices in 1947-49 were used to weight the index for all years through 1954. Beginning in 1955, average retail prices in 1957-59 were used as weights. The index was linked at 1955.

United States Civilian Per Capita Consumption of Fishery Products (Edible Weight), Selected Years 1947-64

Type	1/1964	1963	1962	1961	Average 1957-59	Average 1947-49
Fresh and frozen	2/	5.8	5.8	6.0	5.7	5.7
Canned 3/	2/	4.3	4.4	4.3	4.2	4.1
Cured	2/	0.5	0.5	0.5	0.6	0.6
Total	10.7	10.6	10.7	10.8	10.5	10.4

1/Preliminary.

2/Not available.

3/Excludes canned food products containing small quantities of fish, such as clam chowder.

Note: Alaska and Hawaii included since 1960.

The 1957-59 prices were taken from those collected by the Bureau of Labor Statistics when they were appropriate, but many items were not priced by them, or at least not in the form in which quantities were measured. Since those prices are averages for products with rigid specifications for grade and form, it was necessary to adjust some prices to represent the average of all products consumed. Retail prices compiled by Statistical Reporting Service for use in the family living component of the Prices Paid Index sometimes were used since they relate to all products as purchased. It was necessary to use some price relationships derived from the 1955 Household Food Consumption Survey in adjusting prices from other sources or deriving composite prices. This survey covered farm and rural nonfarm as well as urban consumers.

The variation in the per capita consumption of fishery products from 1961 through 1964 has been almost insignificant. However, the amount of fishery products actually consumed has increased in order to take care of the substantial increase in population. (National Food Situation, NFS-110, November 1964, Food Consumption and Utilization Section,

Economic and Statistical Analysis Division,
U.S. Department of Agriculture.)



Crab

UNITED STATES-JAPANESE TALKS ON KING CRAB FISHING IN EASTERN BERING SEA CONCLUDED:

Consultations between the United States and Japanese delegations on king crab fishing in the eastern Bering Sea, held at Washington, D. C., starting October 15, 1964, were successfully concluded, announced the State Department on November 14, 1964. The delegations agreed to recommend to their respective Governments arrangements to govern the king crab fishery of both countries in the eastern Bering Sea for a period of two years, at the end of which time the two Governments would undertake to hold further similar consultations.

Included in the proposed agreement are: (1) provisions for a level for the Japanese king crab catch in the area of the traditional Japanese fishery in the eastern Bering Sea, (2) interim conservation measures to be applied to the fishermen of both countries in the area, (3) continued and intensified scientific study of the king crab resource, and (4) enforcement of the terms of the agreement. In order to minimize the possibilities of conflict resulting from the differing types of fishing gear, the agreement would specify an area in which only crab pots would be used for commercial crab fishing.



Alaska king crab (*Paralithodes camachatica*)

The consultations were held in fulfillment of the pledge made by President Johnson May 1964 that before implementing the provisions of Public Law 88-308 (the so-called Bartlett Act), the United States would consult with Japan and would give full consideration to Japan's long established king crab fishery. Faced with the opposing legal positions of the two Governments regarding rights under international law to fish the king crab resource, the two delegations agreed on practical arrangements without prejudice to the legal position of either side.

CONFERENCE ON TECHNOLOGY OF KING CRAB PROCESSING:

A two-day conference on the technology of king crab processing was held October 19 and 20, 1964, at the U. S. Bureau of Commercial Fisheries Technological Laboratory, Ketchikan, Alaska. A similar conference on king crab was held in 1962 at the same location. The conference was attended by about 40 fishery industry people representing a wide range of interests in the king crab fishery.

The conference agenda was divided into six major sessions according to the subject matter of the topics. The first session was of a general nature for the purpose of providing information

on the conservation of the king crab resource, foreign interests and their utilization of the resource, and the results of some



Washing and checking meat removed from king crabs in a plant in Alaska.

preliminary exploratory fishing efforts by the Bureau. The first and second technical sessions centered on technological research progress on problems related to the processing of king crab. Lively discussions followed each research progress report since some of the reports provided information that is significant and has immediate applicability by the industry.

The third technical session provided information on Bureau technological research programs which were of indirect interest to the king crab industry. The topics in this session covered research progress on Dungeness crab processing, mechanization of the blue crab industry, and the need for maintaining a sanitary operation in the production of all types of crab meat.

The final two sessions of the conference were of workshop type in which samples of canned and frozen crab meat were examined and evaluated. The purpose of the product cuttings was to observe specific product defects and to discuss processing variables which may influence their occurrence. The consensus was that the quality of crab meat had increased over the average quality level of two years earlier.

A panel of industry representatives was selected at the beginning of the conference to evaluate the conference itself, and to provide some guidelines to the Bureau with respect to the future direction of research on king crab. The panel lauded the work that has been accomplished to date, requested a balanced future program of basic and applied research on king crab, and requested that a third king crab conference be scheduled within the next two years.

ECONOMIC AND MARKETING STUDY OF DEEP-SEA RED CRAB UNDERTAKEN:

A marketing and economic study of the commercial potential of the deep-sea red crab has been undertaken by a University of Rhode Island fisheries economist, announced the University's Director of Public Information, November 13, 1964. Found along the Continental Shelf, ranging from Nova Scotia to Cuba, the deep-sea red crab is now dumped back into the sea by offshore lobstermen who consider them a nuisance.

The University's associate professor of food and resource economics conducting the study said, "If I had a choice between red crab and lobster, I would take the crab. There's no doubt about it in my mind." He obviously speaks from experience, having eaten that species of crab since last fall,

when he arrived in the United States from Rome, Italy, where he had been with the United Nations' Food and Agriculture Organization (FAO).

Bright red when alive and possessing a delicate flavor, the crabs caught by trawlers weigh between 1 and 2 pounds and are about twice the size of the blue crabs which are the mainstay of a substantial industry in the Chesapeake Bay area. Catches of 3,000 to 4,000 pounds of the red crab have been obtained in a one-hour tow. In contrast, it takes an 80- to 90-foot vessel operating out of Rhode Island ports 4 nights and days of trawling to obtain an average catch of 8,000 pounds of lobster.

From the two dozen red crabs cooked and dissected at the University of Rhode Island Agricultural Experiment Station, it was found that 3 average size ones yield about 1 pound of meat. About 24 percent of the meat was in the claws, 36 percent in the legs, and 40 percent in the body. A taste panel, established by the Technological Laboratory of the U.S. Bureau of Commercial Fisheries at Gloucester, Mass., had previously judged the quality, texture, and palatability of crabs cooked at sea and immediately frozen as "good." On another occasion a Rhode Island fish and shellfish dealer hand-picked about 500 pounds of the meat and sold it at retail both in the fresh and frozen form.

Despite the encouraging evidence, the economist making the study is not yet ready to suggest the red crab will form the basis for a new industry. But he does believe that if several major problems can be solved, then New England offshore lobstermen might find red crab fishing profitable because they are already equipped for the deep-sea trawling necessary. "Since the offshore lobster season is limited to the first half of the year, trawling for crabs during fall and early winter might be a satisfactory complementary activity which could offset the seasonability of employment in the lobster industry both at sea and ashore," he explained.

Normally, the crabs are found in waters of more than 200 fathoms (1,200 feet) with the density very great at 250 fathoms. Whether the crabs reproduce fast enough and exist in sufficient numbers to stand up to extensive fishing is not known. Yet today the crabs which seem to congregate in pockets are sometimes caught in such quantities that "lobster boats leave an area to avoid catching them," the economist said. The problems to be solved, according to the economist, are how to preserve the catch and how to process it cheaply once it gets ashore. Unlike the lobster, he does not believe the red crab will survive for extended periods in salt-water tanks aboard ship. This suggests that some method will have to be found to ice the catch. But how long will they last on ice? Will the keeping quality vary from season to season? Would it be better to ice down the catch as it comes aboard or should the catch be bagged first and then iced to reduce handling costs and expedite unloading in port? Will extra crew members be required?

The red crab has a softer shell than lobsters, somewhat elongated spidery legs, and often loses a claw or a leg during the rough ride when it is scooped off the bottom and dumped aboard the vessel. Of the samples brought to the University for study, only 10 percent of the crabs were intact. The damaged ones are liable to die and spoil any whole crabs in a salt-water tank. The second hurdle to be cleared involves finding an economical way of removing the meat from the shell. In the Chesapeake Bay area hand-picking is done, but the economist said the comparatively high costs of labor in Rhode Island and New England might preclude a similar setup. Possible alternatives include shipping the red crabs to an area where experienced hand pickers can be used at a reasonable cost or adapting present mechanical equipment used to remove meat from blue crabs. In addition, the economist believes there may be a way of marketing whole deep-frozen crabs, after the shell has been opened and it has been cleaned inside.

Limited explorations of the distribution of the red crab were carried out in 1959-1960 by the U.S. Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base at Gloucester, Mass. In December 1963 the U.S. Bu-

reau of Commercial Fisheries published Fishery Leaflet 550 which stated, "As trawlers become equipped for fishing in greater depths, this species may become the source of a commercial fishery. At present, the deep-sea red crab remains an untouched resource of unknown value and extent."

Local fishermen and fish and shellfish dealers have already expressed an interest in the red crab study and volunteered their assistance. Meanwhile, the University's economist has been communicating with blue crab processors in the Chesapeake Bay area and will visit them. He expects the initial phase of his work to take about a year. (Press Release of University of Rhode Island, Kingston, November 13, 1964.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-OCTOBER 1964:

Fresh and Frozen: Purchases of fresh and frozen fishery products in October 1964 for the use of the Armed Forces were down 15 percent in quantity from the previous month, although the value of the purchases was about the same in both months. In October 1964 purchases were up for shrimp, but down for scallops, ocean perch fillets, and haddock fillets and portions. Average prices in October 1964 were higher for shellfish items--particularly for peeled and deveined shrimp.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, October 1964 with Comparisons

QUANTITY				VALUE			
Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
1964	1963	1964	1963	1964	1963	1964	1963
..... (1,000 Lbs.) .....				..... (\$1,000)			
2,252	1,817	22,330	19,490	1,484	975	12,303	10,917

Compared with the same month in the previous year, purchases in October 1964 were up 24 percent in quantity and 52 percent in value. Among the leading items, shrimp purchases showed the largest increase in spite of a substantial gain in price. The upward trend in prices for most items in October 1964 was partly offset by lower average prices for ocean perch fillets, haddock fillets, and oysters.

Total purchases in the first 10 months of 1964 were up 15 percent in quantity and 13 percent in value from those in the same period of the previous year. Purchases of shrimp and scallops showed the largest increase. There was some decline in purchases of cod fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

Table 2 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, October 1964 with Comparisons

Product	October				January-October	
	1964		1963		1964	1963
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	
	Pounds	Cents/Pound	Pounds	Cents/Pound	..... (Pounds)	
Shrimp:						
Raw headless	133,850	90.6	1/	1/	1,104,400	1/
Peeled and deveined	258,414	120.4	1/	1/	1,319,036	1/
Breaded	343,370	83.2	1/	1/	3,519,220	1/
Molded and breaded	71,550	60.9	1/	1/	421,320	1/
Total shrimp	807,184	94.4	663,080	78.4	6,363,976	5,681,744
Scallops	111,200	63.5	101,100	55.6	2,422,350	2,163,207
Oysters:						
Eastern	78,227	109.5	1/	1/	707,541	1/
Pacific	57,610	66.3	1/	1/	292,682	1/
Total oysters	135,837	91.2	101,502	95.7	1,000,223	985,225
Clams	7,450	31.2	17,772	29.8	223,353	219,142
Fillet:						
Cod	70,750	33.5	77,740	28.3	453,216	566,425
Flounder	253,150	27.7	225,000	26.6	2,696,652	2,614,927
Ocean perch	269,300	28.6	246,190	32.0	3,060,720	3,178,841
Haddock	67,700	32.2	182,800	35.4	1,651,554	1,849,376
Haddock portions	102,358	45.6	-	-	439,822	-
Steaks:						
Halibut	116,200	44.8	86,100	37.8	1,132,327	1,194,173
Salmon	55,170	66.7	20,100	56.7	228,445	163,750
Swordfish	775	59.2	1,680	55.0	11,410	25,748

1/Breakdown not available.

Canned: The purchases of canned fishery products in October 1964 included over 2 million pounds of canned salmon. That was the first large purchase of canned salmon by the Department of Defense since January 1964. In recent years most of the canned salmon requirements of the Armed Forces have been purchased in the fall of the year. Purchases of other canned fishery products are spread more evenly over the year.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, October 1964 with Comparisons

Product	QUANTITY				VALUE			
	Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
	1964	1963	1964	1963	1964	1963	1964	1963
Tuna	530	281	4,812	2,992	229	123	2,136	1,420
Salmon	2,068	1,448	2,749	1,478	1,213	875	1,630	895
Sardine	33	24	293	399	19	8	172	158

In the first 10 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 61 percent in quantity and 59 percent in value due to larger purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See *Commercial Fisheries Review*, Dec. 1964 p. 37.



Fish Sticks and Portions

U.S. PRODUCTION, JULY-SEPTEMBER 1964:

United States production of fish sticks and fish portions amounted to 42.1 million pounds during the third quarter of 1964, according to preliminary data. Compared with the same quarter of 1963, this was an increase of 4.8 million pounds or 12.9 percent. Fish portions (25.5 million pounds) were up 4.6 million pounds or 22.3 percent, and fish sticks (16.6 million pounds) were up 167,000 pounds or 1.0 percent.

Cooked fish sticks (15.1 million pounds) made up 90.7 percent of the July-September 1964 fish stick total. There were 25.0 million pounds of breaded fish portions produced, of which 20.0 million pounds were raw. Unbreaded fish portions amounted to 474,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 12.5 and 15.0 million pounds, respectively. The Pacific States ranked second with 2.2 million pounds of fish sticks, and the Inland and Gulf States ranked second with 9.8 million pounds of fish portions.

Table 1 - U.S. Production of Fish Sticks by Months and Type, July-September 1964 1/

Month	Cooked	Raw	Total
	..... (1,000 Lbs.)		
July	3,413	401	3,814
August	5,689	624	6,313
September	5,950	521	6,471
Total 3rd Qtr. 1964 1/	15,052	1,546	16,598
Total 3rd Qtr. 1963	15,252	1,179	16,431
Total 1st 9 months 1964 1/	48,992	4,312	53,304
Total 1st 9 months 1963	55,381	3,319	58,700
Total Jan.-Dec. 1963	74,132	5,163	79,295

1/Preliminary.

Table 2 - U.S. Production of Fish Sticks by Areas, July-September 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	12,528	21	12,972
Inland & Gulf States	5	1,865	7	1,883
Pacific Coast States	11	2,205	11	1,576
Total	39	16,598	39	16,431

1/ Preliminary.
2/ Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1960-64

Month	1/1964	2/1963	1962	1961	1960
	(1,000 Lbs.)				
January	7,226	7,554	6,082	6,091	5,511
February	7,061	8,241	6,886	7,097	6,542
March	6,963	8,053	7,658	7,233	7,844
April	5,941	6,546	5,719	5,599	4,871
May	5,422	5,750	5,643	5,129	3,707
June	4,093	6,125	5,117	4,928	4,369
July	3,814	4,870	3,740	3,575	3,691
August	6,313	5,696	5,760	6,927	5,013
September	6,471	5,865	6,582	5,206	5,424
October	-	8,128	6,698	6,133	6,560
November	-	6,471	6,305	6,288	6,281
December	-	5,996	6,027	5,618	5,329
Total	-	79,295	72,217	69,824	65,142

1/ Preliminary.
2/ Revised.

Table 4 - U.S. Production of Fish Portions by Months and Type, July-September 1964 1/

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.).				
July	768	5,654	6,422	105	6,527
August	1,706	7,363	9,069	256	9,325
September	2,522	6,983	9,505	113	9,618
Total 3rd Qtr. 1964 1/	4,996	20,000	24,996	474	25,470
Total 3rd Qtr. 1963	3,832	16,221	20,053	776	20,829
Total 1st 9 mos. 1964 1/	15,481	58,220	73,701	1,733	75,434
Total 1st 9 mos. 1963	12,052	54,903	66,955	2,229	69,184
Total Jan-Dec. 1963	16,623	74,970	91,593	3,054	94,647
Unpublished					

1/ Preliminary.

Table 5 - U.S. Production of Fish Portions by Months, 1960-1964

Month	1/1964	2/1963	1962	1961	1960
	(1,000 Lbs.)				
January	8,526	8,173	5,077	4,303	3,632
February	8,397	7,361	6,360	4,902	3,502
March	8,584	8,835	7,036	5,831	4,706
April	8,064	7,919	6,408	4,484	3,492
May	8,136	7,293	5,818	3,879	3,253
June	8,257	8,774	6,137	4,039	3,995
July	6,527	4,524	4,579	3,962	4,088
August	9,325	6,684	6,687	4,963	3,558
September	9,618	9,621	7,180	5,745	4,631
October	-	9,877	9,871	6,759	5,275
November	-	8,136	7,406	5,789	4,790
December	-	7,450	6,019	5,191	4,459
Total	-	94,647	78,678	59,847	49,381

1/ Preliminary.
2/ Revised.

Table 6 - U.S. Production of Fish Portions by Areas, July-September 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	15,047	23	10,987
Inland & Gulf States	6	9,769	10	9,124
Pacific Coast States	9	654	9	708
Total	38	25,470	42	20,829

1/ Preliminary.
2/ Revised.

Great Lakes

FISHERY LANDINGS, 1963:

The 1963 United States and Canadian commercial catch of fish in the Great Lakes, Lake St. Clair, and the International Lakes of northern Minnesota was 106 million pounds. Landings declined over 17 million pounds compared with 1962. Domestic production accounted for 56 percent of the total volume.

United States fishermen took 59 million pounds of fish valued at \$5.3 million from those lakes in 1963. The quantity declined 6.6 million pounds (10 percent) and value, \$244,000 (4 percent) compared with the previous year. There were slight decreases in the catch of carp, chubs, and lake herring; while moderate increases occurred in landings of sheepshead and smelt.



The State of Michigan led with a catch of over 20 million pounds (2 million pounds less than the previous year). Wisconsin was next with landings of 17 million pounds (down 2 million from 1962). Ohio was third with a catch of 14 million pounds (down 1 million from 1962).

Lake Michigan was the leading contributor to the United States catch (for the fourth successive year) with a yield of 21.0 million pounds--down 2.5 million pounds from 1962. Lake Erie was second with 17 million pounds, followed by Lake Superior with landings of 12 million pounds. The Lake Erie landings fell more than 2 million pounds below the 1962 level, but the Lake Superior catch was about the same as in the previous year.



Great Lakes Fisheries Explorations and Gear Development

SEASONAL DISTRIBUTION AND ABUNDANCE STUDIES OF ALEWIFE, CHUB, AND YELLOW PERCH IN LAKE MICHIGAN CONTINUED:

M/V "Kaho" Cruise 22 (October 19-28, 1964): To extend knowledge of the seasonal distribution and abundance of alewife and chub stocks in northern Lake Michigan and Green Bay, and their availability to bottom trawls, was the primary objective of this cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho. Other objectives were to collect length-frequency data on chub, alewife, and yellow perch, and to collect various species of fish and bottom samples for botulism studies.



Fig. 1 - Exploratory fishing and gear research vessel Kaho of the U.S. Bureau of Commercial Fisheries.

These explorations by the vessel Kaho revealed commercially significant quantities of alewife to be available in central Green Bay, off Sturgeon Bay, Wis., Frankfort, Mich., and in Little Traverse Bay. Good catches of

chub were made off Sturgeon Bay and Frankfort. This information is of special interest to those segments of the fishing industry looking for means to extend the production season for supplying animal-food and fish-meal market outlets.

Fishing Operations: A total of 45 trawl drags were completed with a 52-foot (head-rope) fish trawl during the 10-day cruise. Of the total drags, 18 were completed in Green Bay and 27 in the open lake. All drags lasted 30 minutes except 5 drags, which were terminated early due to snags encountered or for comparison purposes with a previous drag. Heavy trawl damage requiring replacement of the net occurred at 15 fathoms southwest of Washington Island. Minor net damage was encountered on four other occasions. Bottom topography and vertical distribution of fish were continuously monitored and recorded with a high-resolution echo-sounder. Echo-sounding surveys made in the east arm of Grand Traverse Bay indicated most of the area to be unsuitable for bottom trawling.

Fishing Results in Northern Lake Michigan: Commercially significant catches of alewife were taken at 20, 25, and 30 fathoms off Frankfort, Mich.; at 15, 20, 50, and 70 fathoms off Sturgeon Bay, Wis.; and at 20 and 25 fathoms in Little Traverse Bay. Good chub catches were made at 30-45 fathoms off Sturgeon Bay and at 25 fathoms off Frankfort. A good percentage of the chub taken off Frankfort and Sturgeon Bay were large smoker size. One significant catch of sucker (130 pounds) was taken at 35 fathoms in Little Traverse Bay. Smelt were taken in moderate amounts with one drag in 30 fathoms off Sturgeon Bay yielding 90 pounds. No white fish and only 5 individual yellow perch were caught in northern Lake Michigan.

Fishing Results in Green Bay: Catches of alewife were generally light throughout Green Bay with the best catches (500 and 520 pounds) made at 12 fathoms at stations off Washington Island and east of Cedar River. Smelt catches were also light and mostly under 20 pounds for each drag. One drag at 13 fathoms off Cedar River yielded 190 pounds of smelt. South of Menominee, an average of 19 pounds of sucker per drag was taken. Sucker were scarce north of Menominee with the exception of one 300-pound catch taken at 13 fathoms east of Cedar River. Yellow perch were caught in amounts from 1 to 5 pounds in all drags made in southern Green Bay. But no perch were caught at

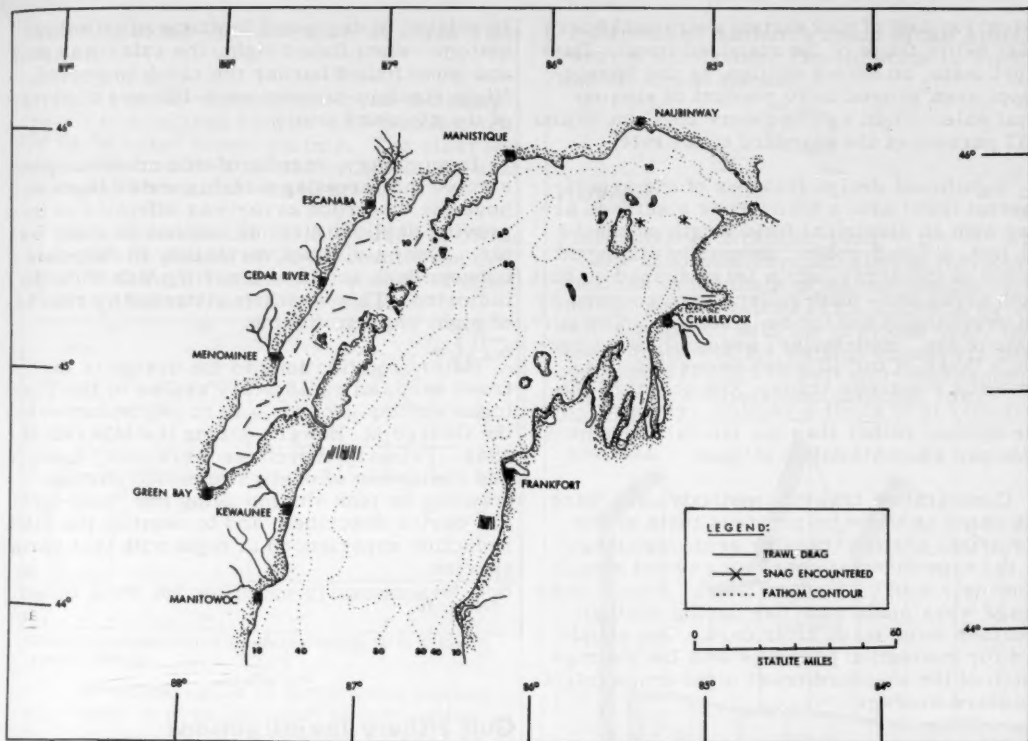


Fig. 2 - Lake Michigan and Green Bay explorations by M/V Kaho cruise 22, October 19-28, 1964.

any stations north of Menominee. Two significant catches of carp (100 and 1,300 pounds) were made in Green Bay at 15 and 10 fathoms, respectively. Catches of other species were insignificant.

Hydrographic data: Surface water temperatures of Lake Michigan ranged from 48.0° to 53.0° F; those in Green Bay from 46.5° to 50.5° F. No thermocline was present in Green Bay, and bottom temperatures varied from 44.6° to 47.4° F. Fishing (bottom) temperatures in Lake Michigan ranged from 39° to 47.4° F. Air temperatures ranged from 39° to 62° F. Bathythermograph (BT) casts were made at each fishing area.

Note: See Commercial Fisheries Review, December 1964 p. 40; November 1964 p. 33.



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 51 -- Phase I (September 3-6, 1964), Phase II (September 15-23, 1964): To initiate evaluation of daytime effectiveness, in clear water, of a trawl designed specifically for electrical shrimp trawling was the primary objective of this cruise in the Gulf of Mexico by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. A secondary objective was to determine efficiency in night fishing.

Previous daytime tests with an electrical shrimp trawl have yielded excellent results when used in turbid water, but relatively poor results in clear water. Daytime effectiveness on pink shrimp in the Cape San Blas area was much better than experienced previously. Electrical trawl catches were variable--ranging to 100 percent of shrimp available. Night elec-

trical catches of pink shrimp averaged 25 percent below those of the standard trawl. Daylight tests, on brown shrimp, in the Mississippi area ranged to 90 percent of shrimp available. Night catches were between 99 and 137 percent of the standard trawl rate.

Significant design features of the experimental trawl are: a transverse electrode array with an electrical field length of about 8½ feet, a "mud-roller" assembly displayed ahead of the array, and a trawl shaped so that both array and "mud-rollers" are covered by an overhang of the top body section. The purpose of the "mud-roller" assembly is to create a layer of turbid water immediately above the electrode array. The object of the turbidity is to elicit a vertical response from the shrimp rather than the lateral movement obtained when visibility is good.

Comparative trawling methods used were the same as those on previous tests of the electrical shrimp trawling gear, consisting of the experimental gear being towed simultaneously with a standard trawl. Four 1-hour drags were made each day during daylight and four were made after dark. The standard for evaluation purposes was the average catch of the standard trawl night drags (night standard average).

Phase I: This phase was conducted in the Cape San Blas area due south of Cape St. George in 12 to 13 fathoms of water. Only pink shrimp were taken in that location. Shrimp availability was extremely variable due to bottom currents and variable substrate type. The night standard average during the test period ranged between 5 and 31 pounds an hour. The electric trawl daytime catch ranged between 50 and 100 percent of the night standard average. Those results, under clear water conditions, were much better than achieved previously, when electric catches were only 10 to 50 percent of the night yield. Night electric catches were 10 to 20 percent below the standard trawl rate, indicating electrically-induced escapement.

Phase II: The second phase of the cruise was conducted south of Horn Island Pass, Miss., in 13 to 14 fathoms. The catch was composed primarily of brown shrimp. The night standard average catch for the 4 days of testing was 25 pounds an hour with no extreme variability. The day electric catch ranged from 30 to 90 percent of the night standard average. The catches were direct-

ly related to degree of footrope proximity to bottom--when fished light, the catch was poor and when fished harder the catch improved. Night electric catches were 100 to 133 percent of the standard trawl.

In summary, results of this cruise demonstrated that creating a turbid water layer above the electrode array was effective in improving daylight electric catches in clear water. Also, a distinct variability in response between pink and brown shrimp was strongly indicated. This was demonstrated by results of night electric fishing.

After modifications to the design of the trawl used, an exploratory cruise to the Tortugas shrimp grounds was to be conducted by the George M. Bowers during the late fall of 1964. Primary objectives were to be: continued evaluation of daylight electric shrimp trawling on pink shrimp using the "mud-roller" device described, and to remedy the catch reduction experienced at night with that shrimp species.

Note: See Commercial Fisheries Review, July 1964 p. 12; April 1964 p. 18.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-22 (October 20-31, 1964): Better than average individual catches of large brown shrimp averaging about 65 pounds, and a good catch of large and medium size white shrimp were made on this shrimp sampling cruise in the Gulf of Mexico by the chartered research vessel Gus III. The cruise was one of a series in a continuing shrimp distribution study conducted by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

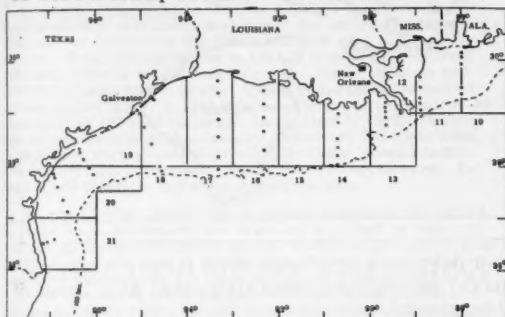
Eight statistical areas from off the Mississippi coast to Texas were covered on this cruise and standard 3-hour tows with a 45-foot Gulf shrimp trawl were made. During the cruise, 35 tows with the 45-foot flat trawl were made, 59 plankton tows, and 42 bathythermograph and 167 water (Nansen bottle) samples were taken. A total of 162 drift bottles were cast at 27 stations.

The largest catch yielding 66 pounds of 15-20 count brown was made in the over 20-fathom depth of area 20; the up to 10-fathom depth

range yielded 14 pounds of 15-20 count white shrimp.

The over 20-fathom depth was the most productive in area 16 with a 63-pound catch of 26-30 count brown shrimp. The other two depths in that area accounted for only a scattering of brown and white shrimp.

Area 21 accounted for 51 pounds of brown shrimp--30 pounds of 31-40 count from the over 20-fathom depth and 21 pounds of smaller size shrimp from 10-20 fathoms.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-22.

A 69-pound catch of large white shrimp was made in area 13, most of it from the up to 10-fathom depth. The catch in area 14 was made up of 20 pounds of white shrimp (21-25 count) from the up to 10-fathom depth and 21 pounds of brown shrimp, ranging from 15-20 count to very small, from the other two depth ranges.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See *Commercial Fisheries Review*, December 1964 p. 45.



Halibut

"GREENLAND HALIBUT" CORRECT NAME FOR THAT FLATFISH SPECIES:

The U.S. Food and Drug Administration (FDA) has determined that the flatfish "Greenland halibut" (*Reinhardtius hippoglossoides*) bears the proper name and is not "flounder" as an FDA 1963 opinion stated. FDA officials say this new opinion cancels their 1963 opinion which was in error, and that "Greenland halibut" has been the proper name since 1946. Some literature refers to that species as Greenland Turbot or Newfoundland turbot.

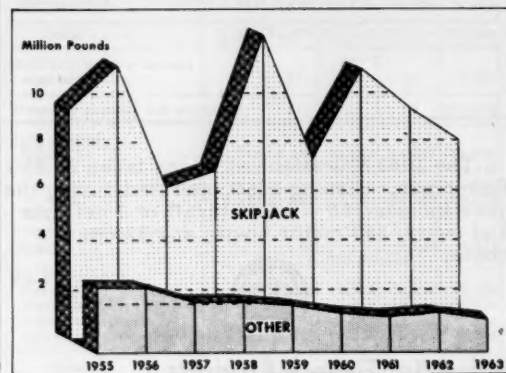
Greenland halibut is found in the Arctic parts of the Atlantic Ocean, south to Finland and the Grand Banks.



Hawaii

FISHERIES LANDINGS, 1963:

The 1963 commercial catch of fish and shellfish in the State of Hawaii totaled 11.7 million pounds valued at \$2.7 million ex-vessel. Compared with the previous year, that was a decline of 1.4 million pounds (11 percent) and \$140,700 (5 percent)--due largely to reduced skipjack tuna landings.

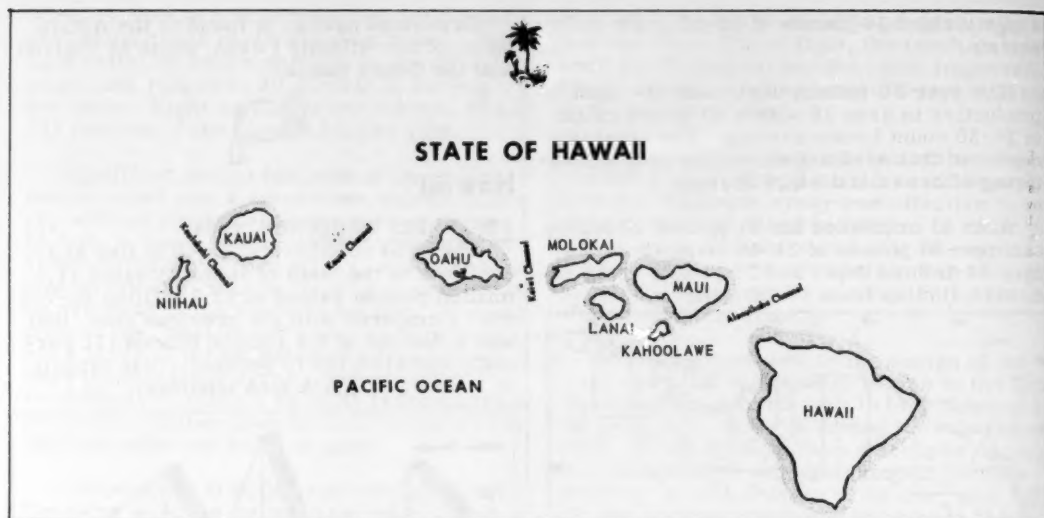


Hawaii tuna catch, 1955-63.

The Hawaiian skipjack catch in 1963 totaled 8.1 million pounds valued at \$1.1 million as compared with the 1962 skipjack catch of 9.4 million pounds valued at \$1.2 million. The Hawaiian big-eyed tuna catch was also down in 1963--948,000 pounds with a value of \$502,000 as compared with the 1962 big-eyed tuna catch of 1.2 million pounds with a value of \$598,000.

The 1963 Hawaiian landings included 385,000 pounds of yellowfin tuna, 401,000 pounds of jack mackerel, 334,000 pounds of striped marlin, 190,000 pounds of black marlin, and 151,000 pounds of big-eyed scad.

Oahu led the Hawaiian Islands in landings during 1963 with 8.7 million pounds or nearly 75 percent of the total. The Island of Hawaii was next with 1.6 million pounds, followed by Maui with 1.2 million pounds. The remainder of the catch was landed at ports in the Islands of Molokai, Kauai, and Lanai.



The 1963 Hawaiian catch was taken by 820 fishermen. Fishing craft operated during the year included 56 vessels (craft of 5 net tons and over), 360 motor boats, and 23 other boats.



Industrial Fishery Products

GROWTH-PROMOTING ABILITY OF FISH SOLUBLES IN CHICK FEED CONFIRMED:

The growth rate of chicks was significantly increased by the addition of condensed fish solubles to basal rations at levels of 3 and 5 percent, according to a summary by British workers of results of their experiments during a period of several years. Rate of growth was increased significantly when solubles were added to an all-vegetable protein ration that met all known requirements except that for the UGF (unidentified growth factor) of fish. Growth likewise was increased significantly when solubles were added to a "more usual chick-rearing mash" containing fish meal at a level of 10 percent. The growth-promoting activity was found to be nearly equally divided between fractions that were soluble in water and other fractions that were not; the latter were separated from diluted fish solubles with a centrifuge. Increase over growth rate on a ration containing only vegetable protein was

6.6 percent and it was even larger when the basal ration contained fish meal at a level of 10 percent.

The fish solubles used were (commercial) good quality condensed herring solubles and, in the trials, the added solubles were substituted for an equal amount of the whole basal ration. The experiments were reported in an issue of *The British Journal of Nutrition* (vol. 18, no. 3, p. 461, 1964). (Technical Advisory Unit, U.S. Bureau of Commercial Fisheries, Boston, Mass., November 4, 1964.)

UNITED STATES MARINE-ANIMAL OIL TRENDS 1964 AND OUTLOOK FOR 1965:

Summary: The total United States supply of marine-animal oils during calendar year 1965 probably will be smaller than the estimated 420 million pounds for 1964, unless domestic production shows a considerable increase. Beginning stocks on January 1, 1965, were expected to be down from the 168 million pounds of January 1964. With imports forecast at about the same level as in 1964, total available supply will be tied largely to the 1965 industrial catch of the domestic fishery, which will not get into full swing until April or May 1965. Over 90 percent of total domestic marine-animal oils are obtained from the menhaden catch landed along the east and Gulf coasts of the United States.

Production: United States marine-animal oil production in 1964 was estimated at 180 million pounds as compared with 186 million pounds in 1963. Production during January-September 1964 totaled 153 million pounds compared with 154 million pounds for the same period in 1963. Production of marine-animal oils in recent years has declined, due to a drop in the menhaden catch.

Imports: United States marine-animal oil imports in 1965 probably will be near the 1964 estimated total of 75 million pounds, due to a relatively tight world supply. Imports during 1963 totaled 83 million pounds. Whale sperm oil, a special oil valued as a lubricant for fine instruments, accounts for about 80 percent of total marine-animal oil imports, with fish-body oils and fish-liver oils each accounting for around 10 percent.

Exports: United States exports of marine-animal oils (mostly menhaden oil) in 1965 will depend primarily upon domestic production. Should the 1965 menhaden fish catch improve, considerably larger exports are foreseen than the 175 million pounds now estimated for 1964. Exports in 1963 totaled 274 million pounds. If offered at competitive prices, a good market exists for menhaden oil overseas, where it is used largely as an edible oil in the manufacture of margarine, shortening, and other products.

Domestic Consumption: Unless supplies loosen up, factory consumption of marine-animal oils in the United States during 1965 will be down from the 1964 estimated total of 82 million pounds. Total estimated use in 1964 is down 8 percent from 1963 and reflects the increasingly tight supply situation and correspondingly higher prices. United States stocks of marine-animal oil on October 1, 1964, amounted to 147 million pounds, as compared to 182 million pounds on October 1, 1963. Factory use of marine oils during January-September 1964 was down in paint and varnish manufacture, fatty acids, animal feeds, and in lubricant production. Utilization was up, however, for resins and plastics, and other drying-oil uses.

Prices: United States fish oil prices (menhaden oil, crude, in tanks f.o.b. Baltimore) are expected to remain at their currently high levels until (next) spring, when 1965 production prospects become clearer. A steady upward trend has carried menhaden oil prices from 4.0 cents per pound in early 1963 to 9.5 cents in November 1964, the highest since January 1957. Prices for 1964 were expected to average around 8.5 cents per pound. (**Fats and Oils Situation**, November 1964.)

U.S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, October 1964: Preliminary data on U.S. production of fish meal, oil, and solubles for October 1964 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

Area	Meal Short Tons	Oil 1,000 Pounds	Solubles (Short Tons)	Homogenized ^{3/}
October 1964:				
East & Gulf				
Coasts	6,683	4,406	3,145	-
West Coast ^{2/}	1,746	678	1,857	-
Total	8,429	5,084	5,002	-
Jan.-Oct. 1964				
Total	193,028	157,901	77,666	-
Jan.-Oct. 1963				
Total	209,670	167,964	83,902	7,224

^{1/}Does not include crab meal, shrimp meal, and liver oils.

^{2/}Includes American Samoa and Puerto Rico.

^{3/}Includes condensed fish.

Production, September 1964: During September 1964, a total of 18.5 million pounds of marine animal oils and 21.671 tons of fish meal was produced in the United States. Compared with September 1963 this was a decrease of 2.6 million pounds of marine animal oils and 2,835 tons of fish meal and scrap. Fish solubles production amounted to 8,227 tons--a decrease of 3,236 tons as compared with September 1963.

Menhaden oil production amounted to 16.8 million pounds--a decrease of 2.2 million pounds. Menhaden fish meal and scrap production in September 1964 amounted to 16,233 tons--a decrease of 3,175 tons as compared with the same month of 1963.

Product	1/1964	Sept. 1963	Jan.-Sept. 1/1964	Sept. 1963	Total 1963
	..... (Short Tons)				
Fish Meal and Scrap:					
Herring	1,238	1,318	9,325	6,630	7,537
Menhaden 2/	16,233	19,408	137,205	154,527	181,750
Tuna and mackerel	2,463	2,089	19,891	16,058	26,957
Unclassified	1,737	1,691	18,178	19,904	22,415
Total	21,671	24,506	184,599	197,119	238,659
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	14,793
Grand total meal and scrap 3/	3/	3/	3/	3/	253,452
Fish solubles:					
Menhaden	6,388	8,982	58,142	64,497	74,831
Other	1,839	2,481	14,522	19,898	25,347
Total	8,227	11,463	72,664	84,395	100,178
Homogenized condensed fish	-	90	-	7,224	7,224
	..... (1,000 Pounds)				
Oil, body:					
Herring	218	243	9,737	4,873	5,709
Menhaden 2/	16,818	19,028	133,624	139,900	167,635
Tuna and mackerel	768	1,077	4,061	3,822	5,735
Other (including whale)	742	828	-5,395	5,770	6,748
Total oil	18,546	21,176	152,817	154,365	185,827

^{1/}Preliminary data.

^{2/}Includes a small quantity of thread herring.

^{3/}Not available on a monthly basis.

Major Indicators for U. S. Supply, September 1964: United States production of fish meal in September 1964 was lower by 11.6 percent as compared with September 1963. Production of fish oil was down by 12.4 percent and production of fish solubles decreased 28.8 percent.

Item and Period	1/1964	1963	1962	1961	1960
	..... (Short Tons)				
Fish Meal:					
Production:					
September	21,671	24,506	31,712	28,800	38,527
January-Sept. 2/	184,599	197,119	249,590	252,274	226,268
Year 3/	-	253,452	312,259	311,265	290,137
Imports:					
September	34,082	35,320	13,698	13,941	9,487
January-Sept.	355,917	304,464	208,694	159,140	97,333
Year	-	383,107	252,307	217,845	131,561
Fish Solubles:					
Production: 4/					
September	8,227	11,553	12,988	11,232	12,523
January-Sept. 2/	72,664	91,619	103,513	93,706	85,316
Year	-	107,402	124,649	112,254	98,929

(Table continued on next page)

Major indicators for U.S. Supply of Fish Meal, Solubles, and Oil, September 1964 (Contd.)					
Item and Period	1/1964	1963	1962	1961	1960
(Short Tons)					
Imports:					
September	214	225	178	263	38
January-Sept.	3,896	2,994	5,196	2,508	2,832
Year	-	6,773	6,308	6,739	3,174
(1,000 Lbs.)					
Fish Oils:					
Production:					
September	16,546	21,176	31,197	25,174	32,685
January-Sept. 2/	152,817	154,365	207,915	221,109	166,863
Year	-	185,827	250,075	258,118	290,143
Exports:					
September	14,190	22,408	219	9,521	13,959
January-Sept.	120,442	187,012	96,624	95,375	108,778
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.
 2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.
 3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
 4/Includes homogenized fish prior to 1964--none produced in 1964.

* * * * *

U.S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1964: Based on domestic production and imports, the United States available supply of fish meal for January-September 1964 amounted to 540,516 short tons--38,933 tons (or 7.8 percent) more than during January-September 1963. Domestic production was 12,520 tons (or 6.4 percent) less, but imports were 51,453 tons (or 16.9 percent) higher than in January-September 1963. Peru continued to lead other countries with shipments of 285,770 tons.

U. S. Supply of Fish Meal and Solubles, January-September 1964 with Comparisons			
Item	Jan.-Sept.		Total 1963
	1/1964	1963	
. . . (Short Tons). . .			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	137,205	154,527	181,750
Tuna and mackerel	19,891	16,058	26,957
Herring	9,325	6,630	7,537
Other	18,178	19,904	37,208
Total production	184,599	197,119	253,452
Imports:			
Canada	42,819	39,535	50,925
Peru	285,770	231,864	291,544
Chile	11,302	22,637	24,248
Norway	-	1,819	1,819
So. Africa Republic	13,087	7,241	12,296
Other countries	2,939	1,368	2,274
Total imports	355,917	304,464	383,107
Available fish meal supply . . .	540,516	501,583	636,559
Fish Solubles:			
Domestic production 2/	72,664	391,619	3107,402
Imports:			
Canada	1,226	1,624	2,034
Iceland	-	-	160
So. Africa Republic	935	191	411
Other countries	1,735	1,179	4,168
Total imports	3,896	2,994	6,773
Available fish solubles supply	76,560	94,613	114,175

1/Preliminary.
2/50-percent solids.
3/Includes production of homogenized fish.

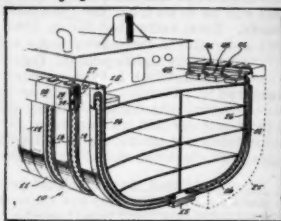
The United States supply of fish solubles during January-September 1964 amounted to 76,560 tons--a decrease of 19.1 percent as compared with the same period in 1963. Domestic production dropped 20.7 percent but imports of fish solubles increased 30.1 percent.



Inventions

NEW SYSTEM TO HELP KEEP DAMAGED VESSELS AFLOAT:

A new safety system for vessels has been patented. To temporarily patch subsurface damage to vessel hulls, the system provides slidable doors which can be moved over the damaged area (Patent No. 3,118,414). To give flotation and buoyancy to damaged vessels, the system provides below waterline flotation chambers which can be positioned by a chain device; additional flotation is provided by air-inflated blankets under each deck (Patent No. 3,122,119). Claims of nonsinkable vessel operation are made for the system when all its features are used. The patents for the system were granted to Robert D. Smith, 2742 E. Tremont Ave., Bronx 61, New York, N.Y. (Products List Circular, Small Business Administration, November 1964.)



Investment Opportunity

TUNA FISHERIES IN RYUKYU ISLANDS:

United States technical and capital participation is being sought by five tuna fishing companies in the Ryukyu Islands. Such a venture would offer a United States investor the advantage of operating in a dollar area under a stable government. United States authorities in the Ryukyus are encouraging the expansion of the tuna industry of the Islands.

Offshore tuna fishing appears to offer the greatest potential for the Ryukyu tuna industry. Tuna canning is another possibility. (As of November 1964, there were no fish canneries in the Ryukyus.)

In September 1964, the Ryukyu tuna fleet had a combined gross tonnage of about 5,500 tons. The Ryukyu Government is interested in licensing new tuna vessels to raise the tonnage of the tuna fleet to 12,000 gross tons by 1969.

In fiscal year 1964, the Ryukyu tuna catch totaled 17,537 metric tons, consisting of 4,970 tons from coastal fishing, 6,904 tons from in-shore operations, and 5,663 tons from off-shore fishing. In fiscal year 1964, the Ryukyu Islands imported marine products (chiefly from Japan) valued at about \$4 million and exported marine products valued at about \$2 million.



Labeling

PENNSYLVANIA ISSUES NEW RULING ON REQUIREMENTS:

A new administrative ruling (Regulation 2504) concerning the prominence, placement, and quantity statements on package labels has been issued by the Pennsylvania Bureau of Standard Weights and Measures. The ruling becomes effective on labels redesigned after January 1, 1965; and to labels prepared from plates made after January 1, 1965; and to all labels after January 1966.



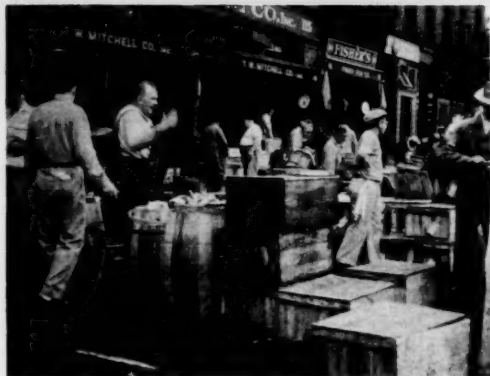
Marketing

EDIBLE FISHERY PRODUCTS, 1964:

The United States catch of food fish in 1964 was expected to decline again. Catches of nearly all of the major species were down--salmon and haddock were notable exceptions. United States fishermen as of October 1964 had landed much less Maine herring, ocean perch, shrimp, halibut, cod, and whiting than in 1963. United States imports of fishery products continued to increase in 1964 and more than offset the lower domestic catch. Imports of Japanese tuna and Canadian frozen groundfish blocks increased sharply during the remainder of the year.

Although supplies of many fishery items were expected to be adequate during the remainder of 1964, some were to become relatively scarce. A few items--salmon and haddock products in particular--were plenti-

ful. Supplies of shrimp, halibut, scallops, and cod were expected to tighten.



View of wholesaler's stand on South Street in the salt-water section of Fulton Fish Market.

The total consumption of fishery products in 1964 increased at about the same rate as population, so little change occurred in the per capita consumption which at 10.7 pounds was up only slightly from the previous year.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U.S. Department of the Interior, and published in the U.S. Department of Agriculture's November 1964 issue of the National Food Situation (NFS-110).



Middle Atlantic States

FISHERIES LANDINGS, 1963:

The 1963 commercial landings of fish and shellfish in the Middle Atlantic States (New York, New Jersey, and Delaware) totaled 487.9 million pounds with a value of \$20.9 million ex-vessel (excluding unclassified trash fish). That was a drop of 46 percent in quantity and 16 percent in value from the previous year due mainly to lower landings of menhaden.

Menhaden 1963 landings in the Middle Atlantic States totaled only 372.9 million pounds with an ex-vessel value of \$4.3 million, compared with 1962 landings of 782.5 million pounds with an ex-vessel value of \$7.9 million.

Substantial declines also occurred during 1963 in Middle Atlantic landings of blue crabs, oysters, and scallops; there were moderate

declines for scup, fluke, whiting, bluefish, butterfish, and cod.

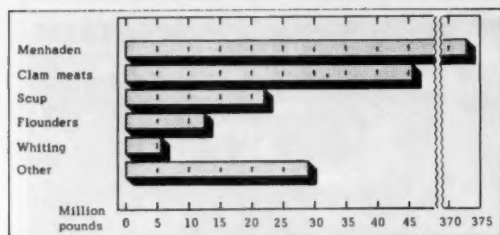


Fig. 1 - Middle Atlantic States catch, 1963.

To offset the decline were increases for tuna landings which rose from 38 tons in 1962 to 2,858 tons, mainly bluefin, in 1963. Landings were also up for surf clams and hard clams, striped bass, sea bass, blackback flounder, and yellowtail flounder.

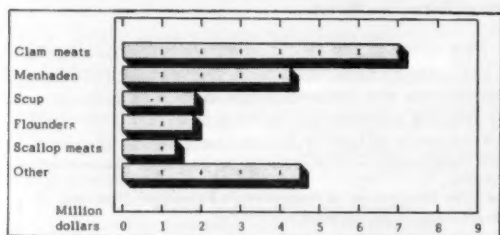


Fig. 2 - Value of Middle Atlantic States catch, 1963.

Of the total 1963 Middle Atlantic landings, New Jersey received 52 percent, New York 27 percent, and Delaware 21 percent. The percentage breakdown by value was New Jersey 50 percent, New York 44 percent, and Delaware 6 percent. The Middle Atlantic catch in 1963 was taken by 8,553 fishermen operating 599 vessels (craft of 5 net tons and over), 4,085 motor boats, and 288 other boats.

New England

FISHERIES LANDINGS, 1963:

The commercial fisheries of the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) in 1963 yielded 829 million pounds of fish and shellfish valued at \$68.3 million ex-vessel. That was a decline from the previous year of 43 million pounds (5 percent), but an increase of \$2.5 million (4 percent).

The 1963 New England catch of groundfish (cod, cusk, haddock, ocean perch, pollock, and white hake) totaled 294.7 million pounds, down 10 percent from 1962. Also well below 1962 landings were menhaden, whiting, and sea scallops. Yellowtail flounder showed the largest increase--up 38 percent for a record New England catch of 78 million pounds in 1963.

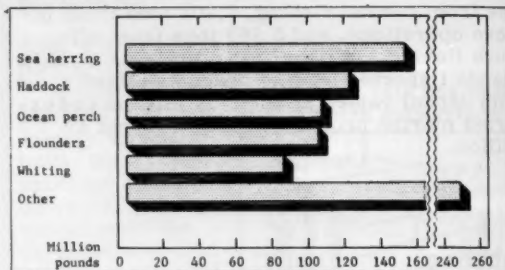


Fig. 1 - New England States catch, 1963.

Average ex-vessel prices for the majority of New England food fish items were higher in 1963 than a year earlier. Shellfish prices were much improved, reflecting to some degree consumer preference for more costly food.

The 1963 landings in each of the New England States, with the exception of New Hampshire, were down from 1962. Massachusetts led in catch with 56 percent of the 1963 New England landings, followed by Maine with 34 percent; Rhode Island 8 percent; and Connecticut and New Hampshire 1 percent each. The catch breakdown by value in 1963 was Massachusetts 60 percent, Maine 31 percent, Rhode Island 6 percent, Connecticut 2 percent, and New Hampshire 1 percent.

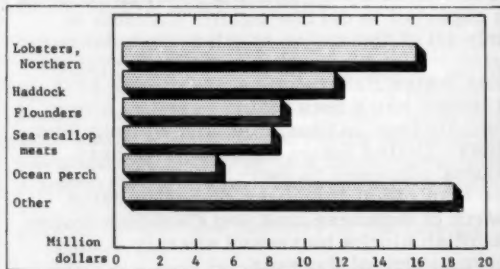


Fig. 2 - Value of New England States catch, 1963.

In 1963, a total of 21,428 fishermen using 733 vessels of 5 net tons or greater and 10,746 other craft operated in the fisheries of the New England area. Compared with the

previous year, that was a gain of 6 vessels, but a decrease of 108 fishermen and 367 other craft.

Manufactured fishery products produced in the New England States in 1963 were valued at \$121.3 million at the processors' level. That was a decline of \$11.7 million from 1962.



North Atlantic Fisheries Investigations

SEA HERRING SURVEY CONDUCTED:

M/V "Delaware" Cruise 64-7 (September 8-12, 1964): The objectives of this cruise were to: (1) sample populations of adult sea herring and to obtain related environmental data, (2) obtain sea herring blood samples, (3) make plankton tests for early fall-spawned herring larvae, and (4) obtain blood samples and measurements from offshore lobsters. The area of operations for these investigations by the U. S. Bureau of Commercial Fisheries research Biological Laboratory, Boothbay Harbor, Me., using the Bureau's exploratory fishing vessel Delaware, was on the Northern Edge of Georges Bank to Cultivator Shoals along the 40-fathom contour line.

During the cruise, 6 otter-trawl sets and 2 gill-net sets were made at stations worked. The trawl sets (45 minutes each) made in waters from 40 to 55 fathoms yielded herring catches ranging from one-quarter to 83 bushels, the average catch per tow being 24 bushels (about 1,800 pounds). The 2 gill-net sets (600 feet of net) for adult herring and sardines yielded a total of three dozen adults. The herring measured from 19.3 to 35.0 centimeters (7.5 to 13.8 inches) long. Preliminary examination indicated that the 1960 year-class contributed about 60 percent of the total samples obtained. During the cruise, 294 herring were sampled for blood which was frozen in liquid nitrogen. No lobsters were obtained.

A total of 19 one-meter net plankton tows of 15-minutes duration (5 minutes at 10 meters or 32.8 feet, 5 minutes at 5 meters or 16.4 feet, and 5 minutes at the surface) were made during the cruise. A total of 41 yolk sac larvae with a mean length of 5.5 millimeters or 0.22 inches (range 4-7 millimeters or 0.12-0.28 inches) were obtained on the northern edge of the Banks.

At trawl sets, gill-net sets, and plankton sets, 5 drift bottles and 5 sea-bed drifters were released. Bathythermograph casts were made, surface salinity samples collected, and weather observations recorded. At the different stations worked the salinity ranged from 32.3 to 33.5 and surface temperatures ranged from 56.1 to 65.0.

Note: See Commercial Fisheries Review, September 1963 p. 35.



North Pacific Fisheries Explorations and Gear Development

NEWLY-DESIGNED

PELAGIC TRAWL TESTED:

M/V "St. Michael" Cruise 4 (October 1-15, 1964): To test the effectiveness of, and determine the catch rate of a lampara trawl was the principal objective of this cruise off the Washington coast near Umatilla by the U.S. Bureau of Commercial Fisheries charted exploratory fishing vessel St. Michael.

The lampara trawl, developed by the Bureau's exploratory fishing base at Seattle, was built to determine if a trawl with a relatively great horizontal spread and a small vertical opening rigged to fish just off-bottom with conventional otter boards could efficiently catch hake without need of depth-telemetry gear. The spread across the wing tips of the net is about 100 feet, while the height of the body at the forward end is 18 feet. The trawl was designed to fish between 2 and 4 fathoms off the bottom with otter boards in contact with the sea bed.

The secondary objective of the cruise was to determine if the "Cobb" pelagic trawl could be rigged to effectively fish both on the bottom and in midwater by rigging the hydrofoil otter boards near the lower wings of the net. During past cruises, hydrofoil trawl boards were placed 60 fathoms ahead of the trawl with bridles running from each hydrofoil back to the upper and lower wing tips. During this cruise the hydrofoils were rigged as shown in illustration.

The lampara trawl caught less hake per hour than the "Cobb" pelagic trawl. The lampara trawl caught an average of 1,600 pounds of fish an hour, mostly hake, in a total of 17 drags compared to an average of 3,400 pounds

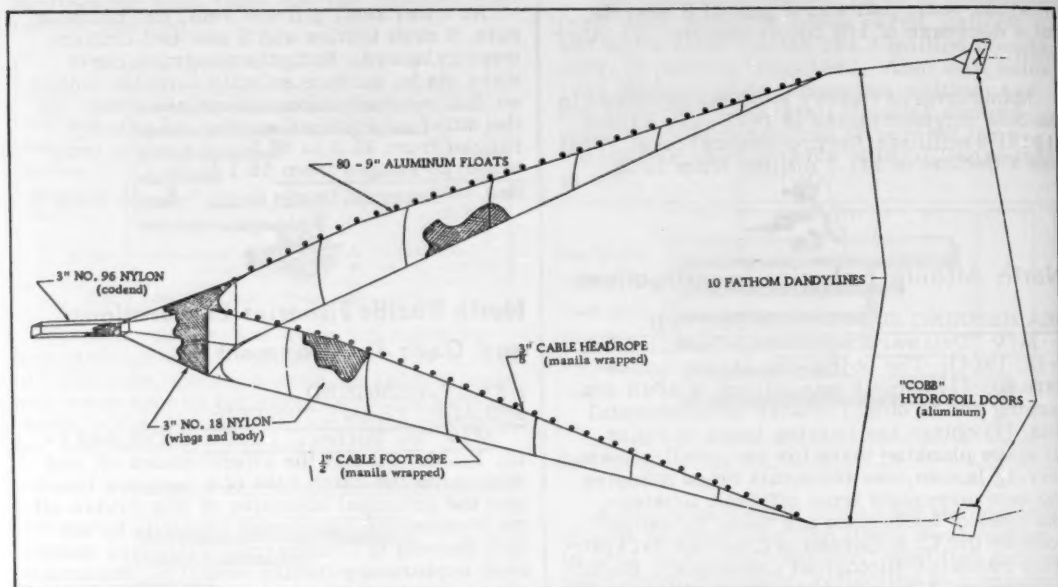


Fig. 1 - Shows lampara trawl tested on St. Michael cruise 4.

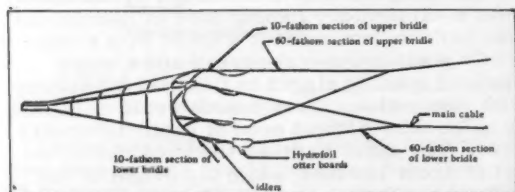


Fig. 2 - Shows "Cobb" pelagic trawl rigged to fish just off-bottom on St. Michael cruise 4.

of fish an hour for the "Cobb" pelagic trawl in a total of 8 drags.

The echo-sounder showed that most fish were not located from 2 to 4 fathoms above the bottom as expected. Most fish were between 4 and 25 fathoms above the bottom. When the lampara trawl was towed with the otter boards on the bottom, the net probably went below most of the fish. When the trawl was tested in midwater, the depth of the net could not be accurately determined and probably wasn't correct to intercept fish during most of the drags. More fish would have been caught with both trawls if an accurate system to determine trawl depth had been used.

During the cruise the lampara trawl was first tested with hydrofoil otter boards. After catching 10,000 pounds of fish in one 60-min-

ute tow, conventional otter-trawl boards were substituted for the hydrofoils. An average of 3,000 pounds of fish per half-hour tow was taken in 3 drags made with the lampara net and conventional otter boards. Examination of the otter-board runners showed that they were not in as firm contact with the bottom as desired. In attempts to improve performance of the otter boards, 16 experimental drags were made in shallow water. After each drag various adjustments were made. In addition to testing light versus heavy otter boards, effects of varying the number of floats on the headrope, varying the amount of trawl cable used, and varying the altitude of the otter boards were examined. But after 16 drags, the otter boards still were not in proper contact with the bottom. Therefore, all further tests of the lampara net were made with hydrofoil boards.

In an attempt to determine trawl depth, a wireless depth telemeter was used. Although the wireless depth telemeter gave accurate readings in calm water at reduced throttle speeds, no useful depth readings were obtained under normal fishing conditions.

An additional 8 drags were made with the lampara net and hydrofoil otter boards. Those

drags caught few fish, the best drag yielding only 1,300 pounds in a 1-hour tow.

The last eight drags were made with the "Cobb" pelagic trawl and the hydrofoil boards. Those drags were more productive, catching an average of 3,400 pounds of fish in each 1-hour tow.

Almost all hake were found in surface to bottom depths of 25 to 65 fathoms. They occurred from the bottom to 40 fathoms above the bottom, with largest concentrations between 4 and 25 fathoms above the bottom. The average length of hake caught during the cruise was about 58 centimeters (22.8 inches). Herring and euphausiids were commonly found in the stomachs.

Note: See Commercial Fisheries Review, December 1964 p. 54.



Oceanography

CONFERENCE HELD ON DYNAMICS OF AIR-SEA CURRENTS:

A Conference on the Dynamics of the Air-Sea Interface, sponsored by the National Science Foundation, was held November 22-25, 1964, at the Institute of Marine Science, University of Miami, Miami, Fla. The conference was attended by leading oceanographers from all over the United States.

A thorough knowledge of the sea's surface, as a meeting place of air and water currents, is considered important in the designing of sailboats and hydrofoil craft. The conference discussed the operation and behavior of such craft under varying sea conditions, as well as the new "air-bubble" type of craft, which ride just above the water on a cushion of air.

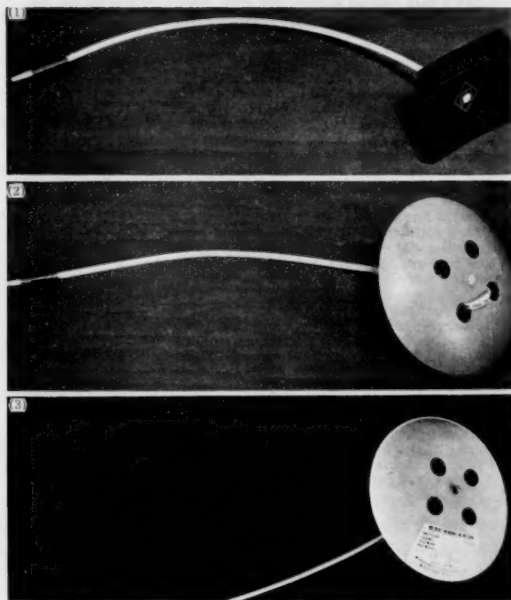
Other sessions were in connection with the effects of ocean waves on anchored buoys. In scientific studies of underwater sound--currently one of the most vital research programs now under way at the Miami Institute of Marine Science and at other oceanographic institutions--a virtually immovable but floating platform is often required to house delicate instruments for precise measurements. Giant manned buoys that move no more than a few inches in 20-foot waves have been designed.

The effect of waves, currents, and winds upon all anchored vessels is considered great. Recently a special ship was designed to act as a drifting platform for the MOHOLE (sea-floor drilling) project, which proposes to lower drilling equipment to the bottom of the

sea and drill a hole 3 miles deep into the sea-floor. That important project, and the special devices and techniques needed to complete it successfully, also was discussed at the conference. (Press release, Institute of Marine Science, University of Miami, Miami, Fla., November 11, 1964.)

"SEA-BED DRIFTERS" AID IN STUDYING WATER CURRENTS:

In recent years oceanographers have been making increasing use of drifting plastic objects known as "sea-bed drifters," in order to obtain information about the movements of the water near the seabed. The drifters are released in batches at certain points in the sea and trail over the seabed, later to be recaptured in the nets of fishermen, or by skin divers, or to be washed ashore and found by the public. Rewards are offered for their recovery and return with details of the position and date of finding. The study of that information enables the oceanographer to construct a picture of the currents near the seabed.



(1) The Craig sea-bed drifter. (2) The Woodhead sea-bed drifter as used by British scientists. (3) The Woodhead sea-bed drifter as used by United States scientists.

Glass bottom-trailing drift bottles with metal wire "tails" were used in European waters at various times from 1904 to 1939 and in United States waters in 1960 and 1961. The plastic sea-bed drifter was first conceived by R. E. Craig of the Marine Laboratory, Aberdeen, Scotland. The present version of it consists of a black plastic square measuring 11.3 x 11.3 centimeters (about 4 x 4 inches), with a reward notice in English inlaid in red. The time and place of release are indicated by a series of punch marks around the edge of the square. Through the middle of the square is fitted a white plastic rod, or "tail" (about 54 centimeters or 21 inches long and 0.65 centimeters

in diameter). This has a small copper weight attached near its lower end, so that the drifter has a slight negative buoyancy and moves over the seabed with its tail just touching the bottom.

The drifter most commonly in use at present was developed by P. M. J. Woodhead of the Fisheries Laboratory, Lowestoft, England. It resembles a toadstool and has a white polythene rod identical with that now used in the Craig drifter, but instead of a black plate it has a red polyethylene saucer of 18.5 centimeters (7.3 inches) diameter. The rod is sharpened to a point at its lower end with a 6-centimeter (2.4-inch) copper ferrule above it; the red saucer has four 2-centimeter (0.8-inch) holes at a distance of 8 centimeters (3.2 inches) from its center. The version used by the Lowestoft Laboratory bears instructions to the finder on the saucer in English, French, and German, and provision has been made so that additional languages can be used if required. A serially numbered yellow polyvinyl chloride tag is secured to the saucer and this bears a reward notice in the English language only.

In Canada and the United States the Woodhead version of the sea-bed drifter is used. The United States sea-bed drifters have a red stem and a yellow saucer, with the serially numbered return labels and instructions in English stuck to the saucer. The Canadian sea-bed drifters have a red saucer and a white rod, with a serially numbered yellow "spaghetti" tag, similar to a fish tag, secured to the saucer for identification and return instruction purposes. The only printing on the spaghetti tag is: "Reward, Ret. Fish. Res. Board St. Andrews, N.B. S-05391."

The Craig type of drifter has been extensively used off the east and west coasts of Scotland, and English workers have made a number of large-scale releases of the Woodhead type in the North Sea and Irish Sea. The rate of recovery of the latter type in the North Sea has been up to 50 percent in 12 months. Releases of Woodhead drifters have also been made off the north-west coast of Norway and in the southeastern Barents Sea. Belgian scientists have now started to use this type of drifter in the southern North Sea. In North American waters the Woodhead type has been released by United States scientists over all parts of the Continental Shelf from the Nova Scotia Banks to Florida. Starting in 1961, sea-bed drifters have been released by Canadian workers on the shelf along the Canadian Atlantic coast from the Bay of Fundy to the Gulf of St. Lawrence. Recently emphasis has been given to simultaneous releases of the sea-bed drifters and drift bottles. The rate of recovery by trawlers from releases made on the Nova Scotian Shelf is of the order of 5 to 6 percent. In 1963, a total of 2,700 sea-bed drifters was released there.

The success of investigations with sea-bed drifters depends very largely on the fishermen and the public who find them. The greater the number of drifters which are returned with accurate details of the positions and dates of their recapture, then the greater is the information available to the oceanographer and the more reliable are his deductions about currents. The active cooperation of fishermen is earnestly requested by all those marine scientists who make use of this particular instrument. (Presented as Document No. 35 to the 14th Annual Meeting of the International Commission for the Northwest Atlantic Fisheries, Hamburg, June 1964.)

* * * * *

DEEP-DIVING SUBMARINE TESTED IN TRIAL DIVES:

The Alvin, a 22-foot oceanographic research submarine designed for ocean deep-diving, was commissioned June 5, 1964, by the Woods Hole Oceanographic Institution, Woods Hole, Mass. After being commissioned, the submarine underwent a long series of tests in local waters around Woods Hole. Tests consisted of short, shallow dives lasting from 1 to 2 hours each in 70 feet of water or less. The purpose of the dives was to teach the pilots how to operate the craft, and to indoctrinate the Institution's scientists in its capabilities when it becomes fully operational.

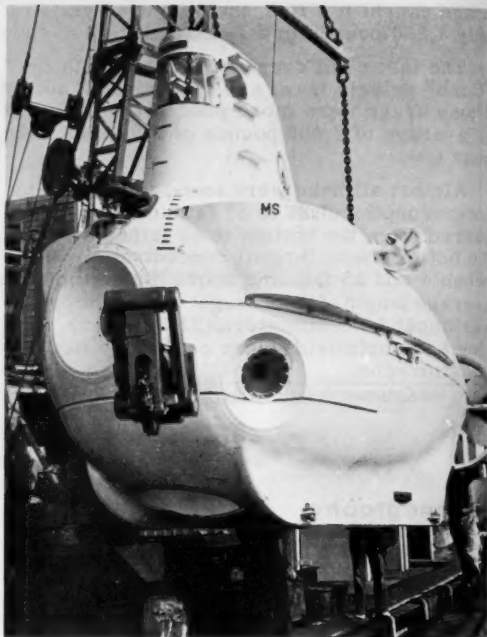


Fig. 1 - Preparing to lower Alvin into the water.

The Alvin underwent a careful part-by-part inspection in the fall of 1964 in order to uncover any existing weak points in her systems and to find out if there were any areas of critical corrosion or undue wear. Final installation was scheduled of instruments such as lights, cameras, depth recorders, etc.



Fig. 2 - Shows Alvin being lowered into the water but not yet waterborne.

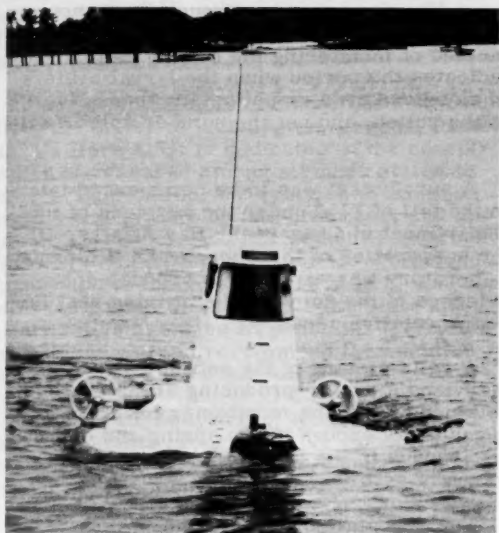


Fig. 3 - Shows Alvin under way on the water's surface.

When completely ready, the Alvin was scheduled to head south for deep-diving in warmer and clearer water. It was expected this would probably be during early 1965 in the Bahamas where she would undergo diving tests down to 6,000 feet. After all tests have proved successful the Alvin will be turned over to the Institution for use on its research programs.

Note: See Commercial Fisheries Review, August 1964 p. 36; April 1964 p. 25.

GULF OF GUINEA SURVEYED BY RESEARCH VESSEL "GERONIMO":

Data collected during a 4-month voyage in the South Atlantic by the oceanographic research vessel Geronimo was to be analyzed by scientists of the U.S. Bureau of Commercial Fisheries and the University of Columbia, announced the Department of the Interior, November 17, 1964. The vessel is operated by the Bureau's Biological Laboratory, Washington, D.C. The primary objective of the survey was to obtain new information which would benefit the fisheries of Senegal, Nigeria, Sierra Leone, and the Ivory Coast, countries which cooperated in the study. According to the Bureau's laboratory director, the information obtained is expected to add materially

to knowledge of the fishery potential in the Gulf of Guinea, and the permanence of a new ocean undercurrent which was discovered on a previous cruise by the Geronimo.

Presence of the newly discovered undercurrent was first indicated in the summer of 1962. Equipment lowered from the vessel into the easterly flowing Guinea current was suddenly pulled to the west. A current meter used during the Geronimo's latest voyage indicated the continued presence of the undercurrent, but since both observations were made in similar weather, the scientists now want to study it during another season to determine its permanence. This will be done during the Geronimo's next trip to the Gulf of Guinea scheduled for January 1965.

Six scientists of the U.S. Bureau of Commercial Fisheries, who made the entire voyage, were joined for portions of the survey by 3 University of Columbia scientists, as well as other Bureau personnel. The University oceanographers were to analyze the data concerning the Guinea undercurrent. A representative of the U.S. National Museum was also aboard the vessel for a portion of the trip to observe bird life.

Note: See Commercial Fisheries Review, November 1964 p. 57; July 1964 p. 24; April 1964 p. 47.



Oregon

SILVER SALMON TRANSPLANTS MAY HELP BUILD RUNS IN WILLAMETTE RIVER SYSTEM:

Successful spawning by transplanted adult silver salmon in the Willamette River system was revealed by stream surveys in late 1964 by Oregon Fish Commission biologists. The surveys were a followup on 6,800 surplus silver salmon distributed from the Oregon Cascade Hatchery into 13 tributaries of the Willamette River. The transplanting program is an experiment since the new waters were not the natal streams of the fish. The surveys confirmed the hopes of biologists that the female fish, gravid with eggs, would spawn in the new environment. Some attempts in the past to transplant adults that were less "ripe" have resulted in the fish moving back downstream, apparently in search of their home waters.

The strong tendency of adult salmon to return to their stream of origin can work against

the expansion of spawning populations. Suitable tributaries with few or no salmon have little chance to develop large runs. Transplanting surplus adult salmon seems to offer a good opportunity to establish production in such areas.

Optimism for the survival and return of the offspring of the salmon transplanted in Willamette River waters is especially high because of the pending construction of the new \$2 million fishway at Willamette Falls, long a barrier to the upstream migration of the species. The fishway's 1966 completion date should accommodate 1964-spawned salmon when they return in 1967 as spawning adult salmon.

Well over 900 redds or spawning nests were observed in the 39 miles of stream covered in the sample appraisal. That was only a small portion of the potential incubation area available in the streams where the fish were released. Spawning silvers were observed as far as 19 miles upstream from the original point of release, and redds were also found in over a dozen smaller tributaries of the streams in which the plants were first made. Further investigations will be conducted in the spring and summer of 1965 to determine the relative success of egg incubation and juvenile rearing.

The transplants of silver salmon in the Willamette River tributaries were only a part of the massive movement of over 25,000 excess adult silver salmon available in 1964 at Oregon Fish Commission hatcheries. The ripe fish, both male and female, were transported to various Oregon release sites stretching from the northeast corner of the State to south coast streams. The effort to develop new silver runs in Oregon has involved some 16 major river systems. In late 1964, the transplanting program was still under way at Oregon Fish Commission coastal hatcheries where late-arriving silver salmon were swamping hatchery facilities. (Oregon Fish Commission, November 19, 1964.)

Note: See Commercial Fisheries Review, Dec. 1964 p. 56.



Oysters

MARYLAND OBSERVATIONS FOR 1964:

Spatfall in 1964: Spatfall in the summer of 1964, as measured by the use of the transite

plates, appears to have been a success in most Maryland areas, although it was not up to the exceptional levels of last year. This method of monitoring the setting pattern only indicates the period when the larval oysters in any given area are attaching themselves to the cultch, and not the number able to survive.

A survey that was to be commenced late in the fall of 1964 under the auspices of the Department of Chesapeake Bay Affairs with the cooperation of the Chesapeake Biological Laboratory was expected to produce some evidence of the number of surviving spat in representative areas.

A valid picture of the setting pattern in Maryland's oyster-producing areas can be obtained only if the monitoring program is begun early enough in the spring and ended late enough in the fall to measure all of the waves of setting.

The last station to receive any set was the County Seed Area in Piney Island Swash, at which a single spat was collected during the week of September 17-23. Setting in the other areas had ended by that time. In the seed areas, such as the upper St. Marys River, parts of Eastern Bay, and Broad Creek, strong waves of setting were recorded, and much good seed was probably produced. Just how well the young oysters fared can only be ascertained by a systematic sampling of bottom material, carried out after the spat have grown large enough to be easily seen.

The setting pattern in the Tred Avon River, Irish Creek, Broad Creek, and Harris Creek was monitored by personnel from the U. S. Bureau of Commercial Fisheries Laboratory at Oxford, Md.

Notes: (1) For more detailed data write to Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. ("Final Report of Maryland Oyster Observations for 1964," Bulletin No. 2, Oct. 20, 1964.)

(2) See Commercial Fisheries Review, Oct. 1964 p. 34.



Pacific Marine Fisheries Commission

ANNUAL MEETING HELD:

The annual meeting of the Pacific Marine Fisheries Commission was held November 18-20, 1964, in San Francisco, Calif. The

meeting was open to the public, and this year was headed by the Director of the California Department of Fish and Game, who presided as chairman.

The Commission is composed of members from the States of Washington, Oregon, Idaho, and California. It is dedicated to the coordination of research among member states to prevent duplication, the adoption of common managerial principles and practices, and the protection of ocean and anadromous resources. The four member States draft and recommend legislation to their respective states, consult with and advise their appropriate state administrative agencies on problems connected with fisheries, and recommend the adoption of regulations they deem advisable.

Included on the agenda of this year's meeting were status reports on five important ocean fisheries--crab, shrimp, groundfish, albacore, and salmon; presentation of technical papers; and resolutions recommending ways to solve mutual problems.



Salmon

PACIFIC NORTHWEST CANNED STOCKS, NOVEMBER 1, 1964:

Canners' stocks of Pacific Northwest canned salmon of 4,032,400 actual cases on November 1, 1964, in the United States were 270,768 cases less than stocks on hand October 1, 1964. Pink salmon made up 52.3 percent (2.1 million cases, mostly 1-lb. talls) of the total canners' stocks, followed by chums

Table 1 - Total Canners' Stocks of Pacific Northwest Canned Salmon, November 1, 1964

Species	Nov. 1, 1964	Oct. 1, 1964
	(No. of Actual Cases)	
King	104,399	134,337
Red	750,438	856,770
Coho	250,162	230,519
Pink	2,109,841	2,218,068
Chum	817,515	863,474
U. S. Total	4,032,400	4,303,168

(818,000 cases, mostly 1-lb. talls), and reds (750,000 cases). The remainder of about 9 percent consisted of coho and king salmon. About 78 percent of the pink salmon stocks on hand was 48 1-lb. cans, and the balance mostly 48 ½-lb. cans.

From October 1 to November 1, 1964, pink salmon stocks were lower by 108,227 cases, reds were down 106,287 cases, and chums were down 45,959 cases.

Carryover stocks at the canners' level amounted to 1,175,588 standard cases on July 1, 1964, which is the approximate opening date of the Pacific Northwest salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply this season to 5,097,944 standard cases.

Shipments at the canners' level July 1, 1964, to November 1, 1964, totaled 2,326,476 actual cases.

Information on canned salmon stocks is based on reports from canners who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, November 28, 1964.)

Table 2 - Total Canners' Stocks on hand November 1, 1964 (Sold and Unsold), by Species & Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48/¼-lb.	14,192	146,307	70,869	7,469	1,072	239,909
48/½-lb.	77,980	340,344	46,816	385,562	109,808	960,510
48/1-lb.	11,915	260,969	117,812	1,648,134	676,690	2,715,520
12/4-lb.	312	2,863	14,665	68,676	29,945	116,461
Total	104,399	750,483	250,162	2,109,841	817,515	4,032,400

Table 3 - Canners' Shipments July 1, 1964-November 1, 1964, by Species & Can Size

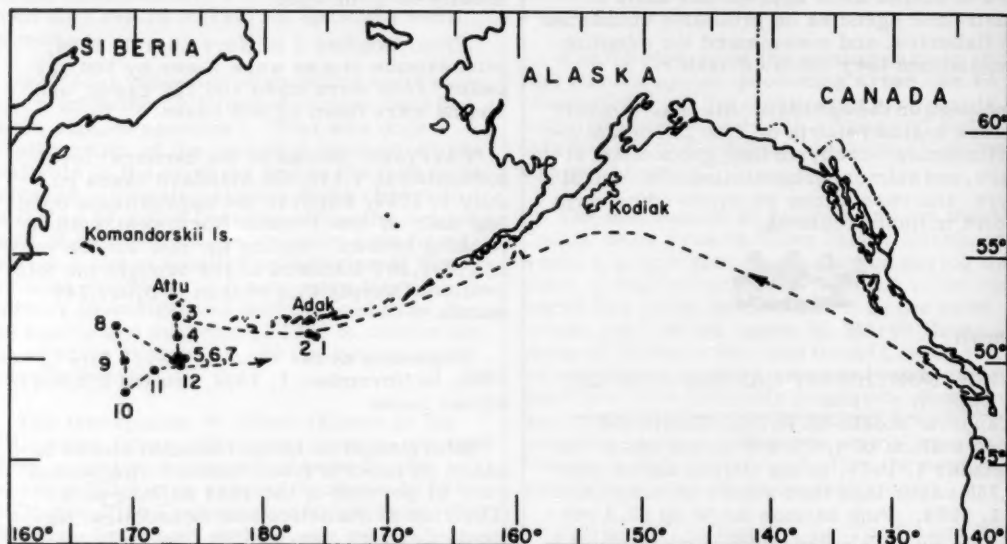
Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48/¼-lb.	10,055	281,625	51,823	4,212	372	348,087
48/½-lb.	58,862	346,750	7,559	217,906	48,283	679,360
48/1-lb.	10,206	237,085	50,697	749,790	201,917	1,249,695
12/4-lb.	104	2,087	6,825	30,721	9,597	49,334
Total	79,227	867,547	116,904	1,002,629	260,169	2,326,476

SALMON RESEARCH CRUISE IN THE WESTERN NORTH PACIFIC:

A salmon research cruise in the western North Pacific Ocean by the U. S. Bureau of Commercial Fisheries research vessel George B. Kelez ended on October 22, 1964, after a 2-month (6,500-mile) trip. The vessel fished stations south of the Aleutian Islands from Adak to the Komandorskii Islands.

Catch results showed that immature sockeye and chum salmon generally were more abundant in the western North Pacific, south of Attu and Komandorskii Island, than in the Adak area.

during autumn the greatest number of salmon taken in gill nets are caught between 8 p.m. and 11 p.m., with the least number between the hours of 11 p.m. to 2 a.m. About equal numbers of salmon were taken between 2 a.m. to 5 a.m. and 5 a.m. to 8 a.m. Other preliminary results indicated that the catch in gill nets fished continuously throughout the night was less than the cumulative catch in gill nets fished for short intervals during the night. The results indicate that dropouts may occur from gill nets and that Bureau scientists may have a way of measuring this possible source of mortality.



Cruise track and fishing stations of R/V George B. Kelez, August 20–October 22, 1964.

In a comparative gear study, crew members set and hauled about $1\frac{1}{2}$ miles each of gill nets and long lines in simultaneous fishing experiments. Biological data of the salmon catches will be compared to determine the selective features of the two forms of gear.

To study the question of gill-net dropouts, Bureau personnel devised a sampling method in which units of gear were set, hauled, and reset at intervals throughout the night. Preliminary results indicate that on the high seas

In addition to obtaining data at sea on salmon lengths, catch by mesh size, and scale samples for age determination of fish, whole frozen fish were brought back to the laboratory for detailed study of the specimens. Studies will be made to determine the country and river of origin of those salmon from the western Pacific.

--By Robert R. French,
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Biological Laboratory,
U. S. Bureau of Commercial Fisheries,
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U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 725



Shrimp

BREADED PRODUCTION, JULY-SEPTEMBER 1964:

United States production of breaded shrimp amounted to 21.6 million pounds during the third quarter of 1964, according to preliminary data.

The Gulf States ranked first in the production of breaded shrimp with 12.7 million pounds. Breaded shrimp production during January-September 1964 amounted to 60.8 million pounds.

Table 1 - U. S. Production of Breaded Shrimp by Months, July-September 1964

Month	Total 1,000 Lbs.
July	8,053
August	6,626
September	6,913
Total 3rd Qtr. 1964 1/	21,592
Total 3rd Qtr. 1963	2/
Total 1st 9 mos. 1964	60,800
Total 1st 9 mos. 1963	2/
Total 1963	75,039
1/ Preliminary.	
2/ Not available	

Table 2 - U. S. Production of Breaded Shrimp by Areas, July-September 1964

Area	No.	July	August	September	Total
			(1,000 Lbs.)		
Atlantic States	14	2,281	2,281	2,296	6,858
Gulf States	21	5,032	3,728	3,930	12,690
Pacific States	8	740	617	687	2,044
Total	43	8,053	6,626	6,913	21,592

Table 3 - U. S. Production of Breaded Shrimp by Months, 1964 and 1963

Month	1/1964	1963
	(1,000 Lbs.)	
January	6,936	2/
February	7,498	2/
March	6,706	2/
April	6,353	2/
May	5,558	2/
June	6,157	2/
July	8,053	2/
August	6,626	2/
September	6,913	2/
October	-	7,390
November	-	6,129
December	-	5,513
Total		75,039
1/ Preliminary.		
2/ Not available		



South Atlantic Fisheries Explorations and Gear Development

LONG-LINING FOR SWORDFISH IN SOUTH ATLANTIC TESTED:

M/V "Oregon" Cruise 93 (July 15-August 7, 1964): To assess the availability of sword-

fish (*Xiphias gladius*) to long-line gear in the Gulf Stream System off the coasts of North Carolina and South Carolina was the objective of this 24-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

Thirteen long-line sets (12 night and 1 day) consisting of a total of 6,300 hooks were conducted in the area covered. A unit of gear was composed of 138 fathoms of mainline, 3 fathoms of branchline and 1 fathom of leader. Buoy drops varied from 1 to 30 fathoms. Baits used were frozen herring (*Clupea*), cigarfish (*Decapterus*), and menhaden (*Brevoortia*). Herring had the highest percentage of loss per hook (49.5 percent) as compared to the cigarfish (18 percent) and menhaden (12 percent).

Only 3 swordfish were taken during the cruise--1 each off Cape Hatteras (1,000 fathoms), Cape Lookout (100 fathoms), and Cape Romain (500 fathoms). The fish from off Cape Hatteras measured 200 centimeters (about 79 inches) and weighed 68 pounds. The swordfish from the other two stations were badly mutilated by sharks, but their live weights were estimated to be from about 110 to 125 pounds each.



Swordfish (*Xiphias gladius*).

One set along the 500-fathom isobath off Cape Lookout, N. C., yielded 4 big-eyed tuna (*Thunnus obesus*). Their weights ranged from 170 to about 280 pounds. Other bony fish species taken on long-line gear included: yellowfin tuna (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*), blue marlin (*Makaira nigricans*), white marlin (*Tetrapterus albidus*), dolphin (*Coryphaena hippurus*), lancetfish (*Alepisaurus* sp.), the gempylid (*Lepidocybium flavobrunneum*), and wahoo (*Acanthocybium solanderi*).

Long-line sets near the edge of the Continental Shelf along the 100-fathom isobath resulted in heavy catches of sharks. The

silky shark (Carcharhinus falciformis) was the dominant species in that area; 94 captures were made at 4 stations. Other species of sharks caught at the same stations included hammerhead (Sphyrna diplana), dusky (Carcharhinus obscurus), mako (Isurus oxyrinchus), and thresher (Alopias superciliosus).

In addition to long-lining activities, trolling lines were fished while steaming between stations. Fish caught on this gear were 9 dolphin, 3 king mackerel (Scomberomorus cavalla), 2 skipjack tuna, and 1 false albacore (Euthynnus alleteratus). No surface fish schools were seen during the entire cruise.

After setting the long-line gear at night, dip-net stations were made using a 500-watt incandescent light suspended over the water surface. Six surface nekton ring-net stations were occupied during setting and hauling of the long-line gear. One larval swordfish was taken with that gear at the 1,000-fathom curve off Cape Romain at night where the surface water temperature was 83° F. All specimens taken at the light-attraction and nekton ring net stations were preserved by U. S. Bureau of Commercial Fisheries biologists for future identification and study.



Species Identification

NEW METHOD RECOMMENDED FOR ADOPTION:

A quick, positive method to identify the species source of the meat in processed fishery products has for some years been under development by the U. S. Food and Drug Administration (FDA). Using electrophoretic principles--a technique in which water-soluble proteins separate qualitatively into band patterns which can be made clearly visible by staining and, like fingerprints, are distinctive for each species of fish--the FDA has developed a "starch-gel" method of fish species identification which has been published as a first action in the Methods of Analysis of the Association of Official Agricultural Chemists. If, after analysis by three collaborating laboratories, the method is accepted by that Association as an official final action, it will be the first official chemical technique for making species identification in processed fishery products. The U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass.,

was one of the three collaborating laboratories in this important study, and their analysis has been sent to FDA for evaluation.

A referee committee of the Association reviewed the final results of the collaborative study and recommended that the "starch gel" electrophoretic method be officially adopted. The results of the study were to be published in the Journal of the Association of Official Agricultural Chemists.



Sport Fish

NEW RESEARCH VESSEL "DOLPHIN" TO STUDY COASTAL GAME FISH RESOURCES:

The U. S. Bureau of Sport Fisheries and Wildlife new research vessel, the Dolphin, a converted Army tug, and first of the Bureau's research vessels to be assigned to coastal exploration of game fish resources, was commissioned at the Sandy Hook Marine Laboratory, Highlands N. J., on October 14, 1964.



Bureau of Sport Fisheries and Wildlife research vessel Dolphin.

The 400-ton, steel-hulled Dolphin is 107 feet long and is powered by a 1,200-horsepower Diesel engine. It cruises at 11 knots and can accommodate a party of 16. Equipped with research and navigational aids--radar, two bathythermograph electric winches, trawling winches, radio-navigation system, fish-finder, and portable fish tanks--the vessel is a floating laboratory. It will further game fish research by enabling fishery biologists and oceanographers to conduct exploratory fishing studies, collect marine specimens, and carry on other field research.

The Dolphin was constructed in 1953 in West Wago, La.



U. S. Fishing Vessels

NEW SWORDFISH LONG-LINING VESSELS:

In November 1964, a Rhode Island shipyard delivered the new swordfish long-lining vessel Chilmark Voyager to her Massachusetts owners. The new 83-foot vessel, together with her sistership, the Chilmark Sword (delivered in September 1964), began working out of New Bedford, Mass.



Fig. 1 - New swordfish long-lining vessel Chilmark Sword.

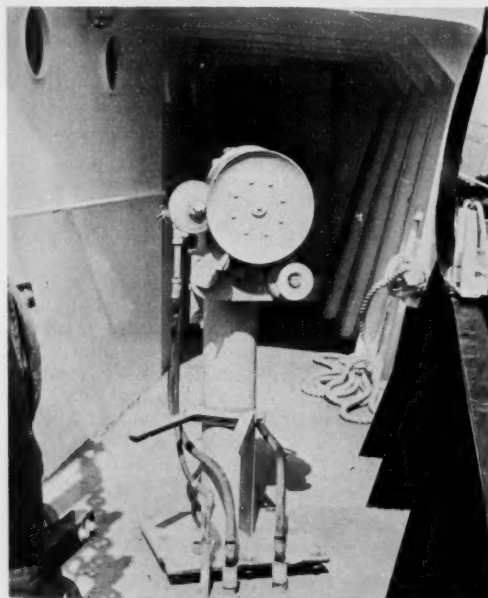


Fig. 2 - Hydraulic line-hauler used aboard Chilmark Sword and Chilmark Voyager.

On her first long-lining trip, the Chilmark Sword returned to New Bedford with 283 swordfish. The quality of the fish was enhanced by the 4-inch plastic insulation in the vessel's plywood-fiberglass hold (3,200-cubic-foot capacity). It was difficult to tell the first of the catch from the last fish taken aboard, according to the skipper of the vessel.

The Chilmark Sword and the Chilmark Voyager are designed for swordfish long-lining on a year-round basis. But they can be quickly converted to stern-trawling. Each vessel is powered by a 460-horsepower Diesel engine driving a 60-inch 4-blade propeller. The vessels carry radar, radiotelephone, and echo-sounding equipment.

Note: See Commercial Fisheries Review, Dec. 1964 p. 64.

DOCUMENTATIONS ISSUED AND CANCELLED:

September 1964: During September 1964, a total of 34 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 45 in September 1963. There were 39 documents cancelled for fishing vessels in September 1964, as compared with 22 in September 1963.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, September 1964 with Comparisons					
Area (Home Port)	September		Jan.-Sept.		Total
	1964	1963	1964	1963	
(Number)					
Issued first documents 2/:					
New England	2	1	26	18	23
Middle Atlantic	2	1	8	16	18
Chesapeake	1	8	27	45	66
South Atlantic	2	8	37	59	77
Gulf	18	24	182	194	239
Pacific	9	3	123	146	160
Great Lakes	-	-	1	4	5
Hawaii	-	-	1	-	-
Puerto Rico	-	-	1	2	2
Total	34	45	406	484	590
Removed from documentation 3/:					
New England	6	-	29	38	48
Middle Atlantic	3	1	14	42	47
Chesapeake	3	3	15	16	25
South Atlantic	8	2	27	45	53
Gulf	6	9	56	87	118
Pacific	11	3	107	68	87
Great Lakes	2	2	9	13	15
Hawaii	-	2	-	3	3
Total	39	22	257	312	396

Notes: For explanation of footnotes, see table 4.

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, September 1964 2/							
Length in feet	New England	Middle Atlantic	Ches- apeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
27-27.9	-	-	-	-	-	1	1
28-28.9	-	-	-	-	-	1	1
31-31.9	-	-	-	-	1	2	3
32-32.9	1	-	-	-	-	-	1
33-33.9	-	-	-	-	1	-	1
34-34.9	-	-	-	-	1	1	2
37-37.9	-	-	-	-	-	1	1

(Table continued on next page.)

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, September 1964 2/ (Contd.)

Length in feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
38-38.9	-	-	1	-	-	1	1
40-40.9	-	1	-	-	-	1	2
42-42.9	-	-	-	-	2	-	2
45-45.9	-	-	-	-	1	-	1
47-47.9	-	-	-	-	-	1	1
49-49.9	-	-	-	-	2	-	2
54-54.9	-	-	-	1	-	-	1
59-59.9	-	-	-	-	-	1	1
60-60.9	-	-	-	-	1	-	1
63-63.9	-	-	-	-	1	-	1
64-64.9	-	1	-	-	2	-	3
65-65.9	-	-	-	1	5	-	6
66-66.9	-	-	-	-	1	-	1
70-70.9	1	-	-	-	-	-	1
Total	2	2	1	2	18	9	34

Note: For explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, September 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
5-9	1	-	-	-	-	1	2
10-19	-	-	-	-	-	5	13
20-29	-	1	1	-	6	1	1
30-39	-	-	-	-	-	1	1
40-49	-	-	-	1	2	1	3
50-59	-	-	-	-	1	-	1
60-69	-	-	-	1	1	-	2
70-79	-	-	-	-	5	-	5
80-89	-	-	-	-	2	-	2
90-99	1	-	-	-	-	-	1
100-109	-	-	-	-	1	-	1
110-119	-	1	-	-	-	-	1
Total	2	2	1	2	18	9	34

Note: For explanation of footnotes, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, September 1964 2/

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
	(Number)						
110-119	-	-	1	-	-	1	2
120	-	-	-	-	-	1	1
130-139	1	-	-	-	2	3	6
145	-	-	-	-	-	1	1
150	-	-	-	-	-	1	1
160-169	-	-	-	-	3	1	4
170-179	-	-	-	-	2	-	2
200	-	-	-	-	1	-	1
220-229	-	-	-	1	5	1	7
250	-	-	-	-	1	-	1
300	-	-	-	-	1	-	1
320	-	-	-	-	1	-	1
330-339	-	-	-	1	2	-	3
380	1	-	-	-	-	-	1
450	-	1	-	-	-	-	1
525	-	1	-	-	-	-	1
Total	2	2	1	2	18	9	34

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/There was 1 undocumented vessel in September 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 26 in 1964; 2 in 1957; 1 in 1956, 3 prior to 1944, and 2 unknown.

3/Includes vessels reported lost, abandoned, forfeited, sold, alien, etc. Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U.S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-October 31, 1964, amounted to 37,162,653 pounds (about 1,769,650 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (14.5 percent) than the 43,462,313 pounds (about 2,069,634 standard cases) imported during January 1-November 2, 1963.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

PROCESSED EDIBLE FISHERY PRODUCTS, SEPTEMBER 1964:

United States imports of processed edible fishery products in September 1964 were down 6 percent in quantity from those in the previous month, although the value of the imports was about the same in both months. The decline in quantity was due mainly to a drop in imports of frozen groundfish blocks and slabs from Canada, Iceland, and Greenland.

Compared with the same month in 1963, imports in September 1964 were up 7 percent in quantity and 13 percent in value. In September 1964 there were larger imports of canned sardines, canned crab meat, sea catfish fillets, flounder fillets, and halibut fillets. But imports were down for canned oysters, canned albacore tuna, and haddock fillets.

In January-September 1964, imports were up 1 percent in quantity and 5 percent in value from those in January-September 1963. During January-September 1964, there were larger imports of groundfish blocks (increase mainly from Canada and Iceland), flounder fillets, yellow pike fil-

U.S. Imports and Exports of Processed Edible Fishery Products, September 1964 with Comparisons

Item	Quantity			Value			
	Sept. 1964	Jan.-Sept. 1964	Sept. 1963	Sept. 1964	Jan.-Sept. 1964	Sept. 1963	Sept. 1964
	.. (Millions of Lbs.)			.. (Millions of \$)			
Fish & Shellfish:							
Imports 1/	48.7	45.7	392.7	388.6	15.2	13.4	118.4
Exports 2/	5.6	2.9	33.7	22.9	3.9	2.1	17.2

1/Includes only those fishery products classified by the U.S. Bureau of Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

lets, sea catfish fillets, halibut fillets, and canned sardines not in oil. But there was a decline in imports of canned tuna, canned crab meat, canned oysters, canned salmon, swordfish fillets, and haddock fillets.

Exports of processed edible fish and shellfish from the United States in September 1964 were up 24.4 percent in quantity and 34.5 percent in value from those in the previous month. Heavy September shipments of canned salmon--totaling almost 3.0 million pounds and going mainly to the United Kingdom--accounted for most of the increase. There was some decline in exports of canned shrimp and canned squid.

Compared with the same month of 1963, the exports in September 1964 were up 93.1 percent in quantity and 85.7 percent in value. Again, the increase was due mainly to larger shipments of canned salmon. Exports were also up for canned squid (principally to Greece and the Philippines), canned sardines not in oil, and canned shrimp. But exports were down for canned mackerel.

Processed fish and shellfish exports in the first 9 months of 1964 were up 47.2 percent in quantity and 62.3 percent in value from those in the same period of 1963. In January-September 1964 there were much larger shipments of canned mackerel and canned salmon. Exports of canned shrimp and canned sardines in oil were also higher, but exports of canned sardines not in oil and canned squid were down.

Notes: (1) Prior to October 1963, the data shown above were included in news articles on "U.S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U.S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U.S. imports of crude or non-processed fishery products is not available; therefore, only import data are, therefore, not comparable to previous reports of "U.S. Imports of Edible Fishery Products." The export data shown are comparable to previous data in "U.S. Exports of Edible Fishery Products." The export data in this series have always been limited to manufactured or processed products.

(2) See *Commercial Fisheries Review*, December 1964 p. 66.

NEW UNITED STATES EXPORT CLASSIFICATION SCHEDULE:

A new classification for United States export commodities was placed in effect January 1, 1965, by the U. S. Bureau of the Census. The new classification is designated as Schedule B, 1965 Edition. The old Schedule B, in effect since 1958, became obsolete on December 31, 1964.

Schedule B, 1965 Edition, contains some 3,600 classifications for export commodities, compared with 2,600 classifications under the old Schedule B. It shows 7-digit rather than 5-digit code numbers. The new export classification must be used for all shipments made after December 31, 1964, and the new 7-digit numbers must be reported for all such shipments.

AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-JULY 1964:

Airborne fishery imports into the United States in July 1964 were up 40.2 percent in quantity and 29.7 percent in value from those in the previous month. The increase was due to heavier imports of shrimp from Venezuela.

Total airborne shrimp imports in July 1964 consisted of 1,049,117 pounds of fresh and frozen raw headless and 12,140

pounds of unclassified shrimp. About 99 percent of the airborne shrimp arrivals in July 1964 entered through the Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Galveston (Tex.), New York (N. Y.), and Puerto Rico. Live northern lobsters from Canada were the main shellfish item other than shrimp imported by air in July 1964.

Fish fillets from Mexico accounted for the bulk of the airborne finfish imports in July 1964.

Total airborne fishery imports in January-July 1964 were down 20.2 percent in quantity and 23.0 percent in value from those in the same period of 1963. The decline was due to smaller shipments of shrimp and spiny lobsters from Central and South American countries.

U. S. 1/Airborne Imports of Fishery Products, January-July 1964 with Comparative Data

Product and Origin 2/	1964		1964		1963	
	July		Jan.-July		Jan.-July	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:						
Mexico	40.6	5.1	269.1	58.3	177.8	53.9
British Honduras	-	-	1.8	0.4	33.9	8.6
Honduras	-	-	-	-	16.5	4.3
Japan	-	-	-	-	2.0	8.2
United Kingdom	-	-	1.9	3.6	1.6	4.2
Iran	-	-	-	-	1.2	7.4
France	-	-	4.3	7.8	0.7	0.6
Rumania	-	-	0.9	9.0	-	-
Venezuela	-	-	4.6	1.7	-	-
U. S. S. R.	-	-	-	-	26.8	70.2
Denmark	0.4	1.1	1.0	2.3	-	-
Canada	-	-	14.8	4.8	-	-
Spain	0.7	0.6	3.9	3.3	-	-
Other countries	-	-	3.8	2.7	0.8	0.3
Total fish	41.7	6.8	306.1	93.9	261.3	157.7
Shrimp:						
Guatemala	-	-	-	-	141.6	74.0
El Salvador	-	-	159.1	96.8	209.1	143.4
Honduras	10.3	3.8	10.3	3.8	22.7	11.9
Nicaragua	6.3	3.6	78.2	44.8	380.2	122.5
Costa Rica	14.8	6.5	203.1	114.6	375.0	179.2
Panama	56.9	41.4	569.0	350.8	1,054.6	561.8
Venezuela	961.9	447.2	3,124.0	1,431.3	3,028.4	1,455.0
Ecuador	-	-	-	-	111.6	39.4
France	-	-	-	-	2.6	0.9
British Guiana	-	-	10.5	5.2	-	-
Mexico	-	-	-	-	13.2	6.9
Other countries	11.1	4.0	12.0	5.1	-	-
Total shrimp	1,061.3	506.5	4,166.2	2,052.4	5,339.0	2,595.0
Shellfish other than shrimp:						
Mexico	-	-	9.0	4.8	79.6	45.3
British Honduras	8.2	2.2	91.0	52.6	113.5	83.5
El Salvador	-	-	-	-	5.0	3.6
Honduras	6.5	1.3	19.4	10.7	1.9	1.0
Nicaragua	-	-	50.5	40.0	101.0	62.3
Costa Rica	-	-	9.3	9.5	73.8	60.1
Jamaica	-	-	43.6	36.2	51.0	40.1
Netherlands Antilles	-	-	-	-	32.8	20.9
Colombia	-	-	-	-	8.0	21.7
Ecuador	-	-	-	-	2.2	1.8
Tunisia	-	-	-	-	0.8	0.9
British Guiana	-	-	14.5	3.2	1.7	0.3
Canada	105.1	60.4	312.9	173.4	213.3	109.2
Venezuela	-	-	-	-	13.7	6.0
Dominican Republic	1.3	0.6	9.1	2.1	22.0	20.7
Bahamas	-	-	10.6	6.8	-	-
Haiti	1.4	0.7	7.0	3.8	-	-
Other countries	0.1	0.1	0.6	0.7	4.8	4.1
Total	122.6	65.3	577.5	343.8	725.1	481.5
Grand total	1,225.6	578.6	5,049.8	2,490.1	6,325.4	3,234.2

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including weight of containers, wrappings, crates, and moisture content.

4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, July 1964, U. S. Bureau of the Census.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

TRENDS IN UNITED STATES EXPORTS OF FISHERY PRODUCTS BY COUNTRY, 1963:

In 1963, the value of United States exports of fishery products gained sharply as compared with 1962. The value of fishery products exported during 1963 was \$56.6 million, an increase of 58 percent. The 1963 value established a record for exports of fishery products. The major products contributing to the increase were fish oils, frozen shrimp, and frozen salmon.

Table 1 - Value of United States Exports of Fishery Products, 1954-1963

Year	Edible	Inedible	Total
	..... (US\$1,000).		
1963	30,379	26,227	56,606
1962	22,470	13,258	35,728
1961	19,594	15,116	34,710
1960	25,622	18,543	44,165
1959	26,747	17,485	44,242
1958	19,440	11,564	31,004
1957	20,549	15,403	35,952
1956	22,939	16,564	39,503
1955	24,923	15,054	39,977
1954	16,238	15,289	31,527

Trend by Countries: During 1963, U. S. fishery products were exported to 108 countries. Of total exports, 75 percent was shipped to six countries: United Kingdom, Canada, Japan, Sweden, West Germany, and Netherlands (table 2). Shipments to all of those countries increased substantially.

Table 2 - United States Exports of Fishery Products by Selected Countries of Destination, 1959-1963

Country	1963	1962	1961	1960	1959
	..... (US\$1,000).				
United Kingdom	13,081	8,249	4,554	8,460	8,928
Canada	11,156	8,846	10,265	10,309	8,644
Japan	7,819	939	2,984	3,295	928
Sweden	4,473	1,076	1,665	2,613	3,176
West Germany	3,638	1,467	1,555	2,201	2,888
Netherlands	2,593	2,273	2,385	4,350	4,352
Switzerland	2,229	1,712	738	1,082	762
France	1,889	1,073	1,007	1,048	766
Italy	1,643	869	423	643	303
Norway	1,539	403	2,390	1,390	1,296
Greece	566	487	364	313	306
Belgium	445	547	351	537	746
Philippines	403	320	582	2,494	5,587
Hong Kong	388	383	368	269	229
Mexico	263	375	459	616	663
Australia	203	198	458	444	157
Venezuela	183	274	360	461	614
Ecuador	1	171	82	293	193
Cuba	-	243	-	175	787
Other	4,094	5,823	3,720	3,172	2,917
Total	56,606	35,728	34,710	44,165	44,242

United Kingdom: In 1963, exports of fishery products to the United Kingdom increased by 58 percent. The United Kingdom displaced Canada as the leading export market for U. S. fishery products, with products valued at \$13.1 million or about 23 percent of the total U. S. exports of fishery prod-

ucts. Fish oils and canned salmon were the principal items shipped to the United Kingdom. Exports of fish oil increased \$3.6 million over 1962. The major fishery commodities exported to the United Kingdom were:

Commodity	1963	1962
	..... (US\$).	
Fish and marine-animal oil	5,142,000	1,511,000
Salmon, canned	6,006,000	5,622,000
Salmon, fresh or frozen	777,000	138,000
Shrimp, canned	798,000	682,000
Other	358,000	296,000
Total	13,081,000	8,249,000

Canada: In 1963, Canada was in second place as an export market for U. S. fishery products. The value of these exports to Canada rose 26 percent above the previous year. The principal items exported to Canada were:

Commodity	1963	1962
	..... (US\$).	
Shrimp, fresh or frozen	2,165,000	2,081,000
Shrimp, canned	1,592,000	1,462,000
Seal furs	1,935,000	1,024,000
Fish, fresh or frozen	1,043,000	766,000
Canned fish	1,002,000	696,000
Fish, shellfish and other marine animal products, inedible	879,000	703,000
Fish, marine animal and liver oil	543,000	559,000
Salmon, fresh or frozen	581,000	197,000
Other	1,416,000	1,358,000
Total	11,156,000	8,846,000

Other Countries: The values of the principal fishery products exported to other major markets were:

Country & Product	US\$
Japan:	
frozen shrimp	5,153,000
unmanufactured shell	2,075,000
Sweden, fish oil	4,121,000
W. Germany, fish oil	2,293,000
Netherlands, fish oil	1,644,000
Switzerland, seal fur	1,989,000
France:	
frsh. or froz. salmon	803
seal fur	348
Italy, seal fur	956

Trend by Areas: During 1963, Europe imported products valued at about \$32.9 million, representing 58 percent of total U.S. fishery exports (table 3). The countries of the European Free Trade Association (EFTA) imported products with a value of \$21.8 million, or 38 percent of U.S. exports of fishery products. The members of the European Economic Community (EEC or Common Market) obtained fishery products valued at \$10.2 million, or 18 percent of total fishery exports. North American countries took products valued at \$13.2 million, or 23 percent of total U.S. fishery product exports.

Table 3 - United States Exports of Fishery Products by Area of Destination, 1963

Area	Edible	Inedible	Total
	..... (US\$1,000).		
Europe	12,669	20,181	32,850
North America	9,547	3,695	13,242
Asia	6,836	2,174	9,010
South America	265	97	362
Africa	436	33	469
Oceania	625	48	673
Total	30,378	26,228	56,606

Trend by Commodities: In 1963, significant gains were made in exports of most of the major fishery products (table 4). Fish oils were the leading commodity entering this trade, accounting for 28 percent of total exports. Exports of fish oil increased 159 percent over 1962 owing to a substantial strengthening in the export market which had remained dull during most of 1962. Salmon products valued at about \$11.3 million were next in importance followed closely by shrimp with a value of \$10.8 million.

Table 4 - Value of United States Exports of Fishery Products by Selected Commodities, 1959-1963

Commodity	1963	1962	1961	1960	1959
..... (US\$1,000)					
Fish oils	15,636	6,047	8,908	10,688	11,902
Seal furs	5,877	3,851	3,097	3,309	2,580
Shells, unmanufactured	2,136	1,285	1,380	2,636	977
Miscellaneous fish (mostly fresh water, fresh or frozen)	1,858	1,135	809	947	622
Oysters, shucked	191	311	448	497	575
Salmon:					
Fresh	2,530	872	647	1,677	659
Cured	509	528	593	435	372
Canned	8,239	7,292	5,580	8,830	10,638
Mackerel, canned	681	671	581	211	135
Miscellaneous fish, canned	628	460	391	355	326
Sardines, canned, not in oil	666	1,285	1,336	3,443	5,843
Shrimp, fresh or frozen	7,748	3,299	3,694	2,303	1,682
Shrimp, canned	3,054	2,572	2,487	3,383	2,898
Squid, canned	742	729	353	691	906

Foreign trade plays a significant role in the economics of the U. S. fishing industry. The United States is a leading importer of fishery products, buying foreign products valued at almost \$500.0 million in 1963. Exports, valued at \$56.6 million, provide important markets for certain products of U. S. fisheries. Many of those products are well recognized in world trade.



Wholesale Prices.

EDIBLE FISH AND SHELLFISH, NOVEMBER 1964:

Most of the fresh and frozen unprocessed finfish items were lower-priced from October to November 1964 and the overall wholesale price index for November dropped 2.4 percent from the previous month. At 108.9 percent of the 1957-59 average, the index this November was 2.6 percent higher than in the same month of 1963.

November prices for all of the major products in the drawn, dressed, or whole finfish subgroup were considerably lower than in October. A 16.3-percent drop in that index was due mainly to relatively sharp price declines for halibut, haddock, and salmon. At New York City, western halibut prices were 31.5 percent lower because of the seasonal changeover from the fresh to frozen. End-of-the-season fresh halibut supplies at New York City were very light in October and prices were high. Frozen dressed king salmon at New York City in November was lower-priced (13.8 percent lower) than the fresh which was still available the previous month. Ex-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Nov. 1964	Oct. 1964	Nov. 1964	Oct. 1964	Sept. 1964	Nov. 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.9	111.6	109.7	106.1
<u>Fresh & Frozen Fishery Products:</u>					113.0	116.6	113.7	109.0
<u>Drawn, Dressed, or Whole Finfish:</u>					111.7	133.4	129.1	117.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.17	107.8	135.5	110.9	124.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.38	.56	112.4	164.1	162.7	97.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.96	115.6	134.1	136.2	124.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.50	.54	74.6	79.8	70.9	83.6
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.65	.48	106.4	77.8	90.1	75.3
<u>Processed, Fresh (Fish & Shellfish):</u>					111.1	106.5	107.4	107.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.44	.40	106.9	97.1	106.9	131.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.88	.83	102.5	96.7	95.5	85.0
Oysters, shucked, standards	Norfolk	gal.	7.25	7.13	122.2	120.1	122.2	130.7
<u>Processed, Frozen (Fish & Shellfish):</u>					110.8	104.7	100.0	98.6
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.35	.36	88.7	91.2	92.5	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.39	.38	112.9	109.9	108.5	111.4
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	103.4	103.4	103.4	119.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.95	.87	112.7	103.2	95.5	89.5
<u>Canned Fishery Products:</u>					102.2	103.1	103.1	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.25	21.75	92.6	94.8	94.8	101.3
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	96.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	97.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	113.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

vessel prices at Boston for large haddock were down sharply (20.4 percent) from the high of the previous month. In contrast, prices skyrocketed (up 36.7 percent) for Lake Huron fresh round yellow pike because of very light supplies. As compared with November 1963, the subgroup index this November was 4.5-percent lower mostly because of lower prices for haddock and salmon.

All products listed in the subgroup for processed fresh fish and shellfish were higher-priced in November 1964 and the index was up 4.3 percent from the previous month. Prices for frozen haddock filets rose 10.1 percent (but those prices were 18.5 percent lower than in November 1963) and South Atlantic fresh shrimp at New York City were up 6.0 percent. A somewhat stronger market for shucked standard oysters pushed November prices for that product up although those prices were 6.5 percent lower than in November 1963. As compared with the same month a year earlier, the subgroup index this November was higher by 3.6 percent largely because of substantially higher fresh shrimp prices.

A 5.8-percent increase from the previous month in the November 1964 processed frozen fish and shellfish subgroup in-

dex was due to higher frozen shrimp prices (wholesale price up 8 cents a pound) at Chicago. As compared with November a year earlier, the subgroup index this November was higher by 12.4 percent because of sharply increased prices (up 25.9 percent) for frozen shrimp. Prices this November for several species of frozen filets in the subgroup were below those in November 1963 and tended to cancel out part of the November 1964 strong subgroup index rise caused by high shrimp prices.

Lower prices from October to November for Alaska canned pink salmon accounted for an 0.9-percent drop in the canned fishery products subgroup index. Prices for other canned fish items remained the same as in the previous month. Stocks of canned pink salmon were liberal in November and prevailing prices were lower than a year earlier by 8.6 percent. November 1964 prices for canned Maine sardines were unchanged since September. With the sardine packing season drawing to a close, the 1964 pack was slated to run far short of the previous season. The November 1964 subgroup index was 1.0 percent higher than in the same month a year earlier. Prices this November were higher for all canned fishery products except pink salmon.



SONAR TAGS USED TO STUDY FISH MIGRATIONS

Strange noises heard coming from a number of fish swimming in Lake Mendota, near Madison, Wis., were not so strange to aquatic biologists, who had equipped the fish with an ultrasonic signaling device to study their migratory habits.

Tags smaller than the tip of a pencil were inserted into the stomachs of whitebass. These tags chirp ultrasonic signals (70 to 150 kilocycles), which are picked up by an underwater receiver in a boat following the fish. Researchers began experimenting with the tiny transmitter about a year ago. They have been charting the courses of the bass to discover how those fish so unerringly find their way back to home spawning grounds.

The white bass, which spawn in late May and early June, were chosen for the study because they always spawn in the same two areas of the lake near the shore. The tracking boat must stay within one-half mile of the marked fish and can receive signals for about 15 hours before the power supply is exhausted, the researchers reported. By tracking and charting the paths of the sonar-equipped fish in the lake, the researchers are trying to find environmental guides that the fish may use in their journey.

The researchers, who reported their fish-tracking work at a meeting of the National Academy of Sciences in Madison, are in the process of developing a more advanced tag to study the larger salmon. Eventually, the ultrasonic tag may be used to follow the migration patterns of other aquatic animals, such as porpoise and turtles.

The study is being supported by a National Science Foundation research grant. (Science News Letter, October 24, 1964.)



FOREIGN

International

EUROPEAN ECONOMIC COMMUNITY

EEC COMMISSION WANTS TO MOVE UP TIMETABLE FOR CUSTOMS UNION:

The Commission of the European Economic Community (EEC) presented on October 2, 1964, in Brussels to the six member states a proposal to hasten the removal of intra-Community trade barriers and the completion of the common external tariff.

Dubbed "Initiative 1964," the proposal would bring the common external tariff for the EEC into effect on January 1, 1966, a year earlier than planned. At the same time, the size of internal EEC tariff cuts would be increased and all internal tariffs on industrial goods abolished by January 1, 1967. The initiative was offered to stimulate EEC decision-making.

The EEC Commission's initiative contained the following proposals:

- (1) establish the common external tariff on January 1, 1966;
- (2) speed internal tariff cuts to complete the customs union by January 1, 1967;
- (3) abolish indirect obstacles to trade within the EEC, particularly all controls at internal frontiers;
- (4) adopt a proposal for the progressive introduction of a monetary union;
- (5) intensify work in the social field.

The Commission will also submit, possibly before January 1, 1966, proposals concerning definition of origin and customs values, anti-dumping and compensatory duties, common arrangements for processing traffic, the unification of national provisions on free entry on economic grounds, and bonded warehouse

and free ports. The Commission will also propose a procedure for operating EEC tariff quotas and rules for the uniform application of the common external tariff.

The aim of the proposals, the Commission said, is the free movement of goods between EEC member states, beginning 1967. (*European Community Bulletin*, October 1964.)

FISH MEAL

WORLD PRODUCTION, SEPTEMBER 1964:

World fish meal production in September 1964 was lower than that in any previous month in 1964 due mainly to seasonal declines in the major producing countries.

World fish meal production in the first 9 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 49 percent of world output during January-September 1964. Higher production during January-September 1964 was also reported in Norway, South Africa, Chile, Iceland, and Angola. The increase was partly offset by lower production in Canada and the United States.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	Sept.		Jan.-Sept.	
	1964	1963	1964	1963
	(Metric Tons)			
Canada	2,985	5,495	39,896	52,030
Denmark	12,620	10,478	82,571	80,443
France	1,100	1,100	9,900	9,900
German Fed. Republic	6,521	7,591	57,176	58,207
Netherlands	1/	1,200	2/ 3,500	4,700
Spain	1/	2,178	1/	16,912
Sweden	889	672	5,300	4,535
United Kingdom	5,185	6,077	58,223	58,241
United States	19,658	22,229	167,450	3/178,807
Angola	6,376	1,280	42,073	17,774
Iceland	15,693	13,277	102,245	77,337
Norway	12,257	14,086	146,815	102,085
Peru	49,478	47,828	1,059,070	826,673
So. Afr. (incl. S.-W. Afr.)	18,300	21,669	236,792	218,323
Belgium	375	375	3,375	3,375
Chile	10,777	2,438	114,236	75,019
Morocco	4,000	1/	17,150	1/
Total	166,214	157,973	2,145,572	1,784,361

1/ Data not available.

2/ Data available only for Jan.-June 1964.

3/ Revised.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

International (Contd.):

FOOD AND AGRICULTURE ORGANIZATION

FISHERY PROBLEMS DISCUSSED AT 11TH SESSION OF INDO-PACIFIC FISHERIES COUNCIL:

Numerous facets of fisheries research and the fishing industry in general, were considered and discussed at the 11th Session of the Indo-Pacific Fisheries Council (IPFC) of the Food and Agriculture Organization (FAO), held at Kuala Lumpur, Malaysia, October 16-31, 1964. Attention was focused mainly on problems confronting Asian countries, with emphasis on the conflicts arising between large-scale trawlers and inshore fishermen.

On certain problems relating to the fishing industry in Malaysia, the Council recommended that: (1) Malaysia should carry through with its present experiment for trawling in the waters around Pulau Langkawi; (2) a loan fund should be established to assist inshore fishermen in developing new fishing techniques, such as trawling, to improve catches; (3) research should be carried out to assess groundfish resources in relation to the amount of fish caught; and (4) appropriate measures should be adopted to prevent overfishing.

During the session, FAO spokesman announced the FAO was planning to establish a separate fisheries department in its organization. The Regional Information Advisor of that Organization stated that FAO is planning to make documentary films, tape recordings, and reports on fishing activities in that part of the world.

At the session, a Canadian Colombo Plan expert attached to the Planning and Research Branch of the Ministry of Agriculture and Cooperatives, suggested that the Government should take over the marketing of fish initially to release the middleman's grip on fishermen in developing countries

Member countries participating in the Conference included Australia, Ceylon, France, India, Japan, Korea, Malaysia, Netherlands, Pakistan, Philippines, Thailand, United Kingdom (for Hong Kong), the United States, and Viet-Nam. Two nonmember countries, New Zealand and Norway, and six international organizations sent observers. The international organizations included the General Fisheries Council for Mediterranean

(GFCM), the International Oceanographic Commission (IOC), Pacific Science Association (PSA), Pan Indian Ocean Science Association (PIOSA), the United Nations Technical Assistance Organization Board (UNTAB), the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the Food and Agriculture Organization (FAO). Burma, Cambodia, and Indonesia did not participate. (United States Embassy, Kuala Lumpur, November 5, 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 73

SARDINE-TAGGING SEMINAR:

How best to tag the tiny sardine, and then what to do with the tag once it has been recovered, was discussed by 18 Mediterranean sardine scientists at a meeting held in Split, Yugoslavia, November 2-14, 1964. The seminar on sardine tagging in the Mediterranean was sponsored by the Food and Agriculture Organization (FAO).

The sardine is of very significant commercial importance to the fishing nations of the Mediterranean. Tagging is a basic tool for determining the growth, distribution, migration, habits, mortality rate, stock, and population size of the fish. Yet the sardine is one of the most difficult fish in the world to tag.

At the seminar, the scientists hoped to work out a model program--including methods of tagging and tag recovery, suggestions for improving cooperation between the various countries--to be presented before a session of the General Fisheries Council for the Mediterranean to be held in Rome in March 1965. (Food and Agriculture Organization, Rome, October 28, 1964.)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION**11TH ANNUAL MEETING:**

The 11th Annual Meeting of the International North Pacific Fisheries Commission (made up of representatives from Canada, Japan, United States) was held in Tokyo, Japan. The plenary sessions started November 16, 1964. The meeting extended over nearly 4 weeks, with 3 weeks of scientific sessions preceding the week of plenary sessions.

The Commission reviewed the results of conservation programs and scientific research on North Pacific fishery resources and discussed their implications for the fishing industry.

International (Contd.):

tries of the three countries. Nearly 100 administrators, scientists, technical and industrial advisors and observers took part in the discussions, which centered around the general problem of ensuring the continued orderly development of the North Pacific fisheries resources under effective conservation safeguards.

At this meeting the Commission did not recommend any change in the list of stocks of fish under the "abstention" provisions of the North Pacific fisheries convention.

One of the Commission's major concerns at this meeting was with the condition of the halibut resource of the Eastern Bering Sea, where in 1964, for the second year, the Commission was responsible for regulating a fishery shared by fishermen of the three countries. In the 1964 fishing season, halibut fishermen of the three countries were able to catch only about one-third of the catch quota of 6,393,340 pounds set by the Commission. In view of this and other evidence that the Bering Sea halibut resource is at a low ebb, the Commission recommended to its Member Governments that fishing in the quota area be limited to only 7 days, and the open season in other parts of the Eastern Bering Sea will also be shortened. Other regulatory measures were approved for recommendation to the Governments by the Commission.

The Commission has also been concerned in recent years with the problems created by the developing fisheries for the shrimp and bottomfish, such as flounder, ocean perch, and sablefish (black cod), in the Gulf of Alaska. At this year's meeting the Commission noted that development of the trawl fisheries by Japan has been proceeding gradually and with due regard to their effects on the halibut fishery. The results of research on this problem, as reported to the Commission at the annual meeting, held out hope that proper selection of fishing gear and operating techniques will minimize damage to the halibut stocks as the rich resources of other bottomfish come under increased exploitation. Research on those problems and exchange of scientists and data will be continued. In this connection, the Japanese representatives offered to facilitate studies of bottomfish by Canadian and United States scientists aboard Japanese trawlers in the Gulf of Alaska.

The Commission, which during recent years has examined the condition of the king crab fishery of the Eastern Bering Sea to determine whether conservation measures are needed, noted that the Governments of Japan and the United States have recently negotiated an agreement regarding that fishery. In response to requests from the two Governments, the Commission resolved to continue and to strengthen its program of king crab research.

At the 11th Annual Meeting the Commissioners heard reports of further progress in the publication of results of the research carried on by Commission scientists over the past 10 years. One of the major elements in this publication program is a nine-part comprehensive report on the biology of North Pacific salmon written jointly by scientists from the three countries. The writing of this major contribution is largely finished, and several sections are scheduled for publication in 1965.

The 12th Annual Meeting of the International North Pacific Fisheries Commission will be held at Seattle, Wash., with the first plenary session scheduled for November 8, 1965. The new Chairman of the Commission will be Edward W. Allen of the United States, the new Vice-Chairman will be A. W. H. Needler of Canada, and the new Secretary will be Iwao Fujita of Japan.

INTERNATIONAL NORTH PACIFIC
FISHERIES CONVENTIONCANADIAN FISHERIES MINISTER REPORTS
ON OTTAWA RENEGOTIATION TALKS:

The third round in a series of talks between Canada, Japan, and the United States on the International Convention for the High Seas Fisheries of the North Pacific Ocean, which opened in Ottawa, September 9, 1964, ended on October 1.

While considerable progress was made at the meeting with respect to exchange of views and the study of proposals in efforts to resolve remaining differences between the three Parties to the Convention, it was decided by the delegations that complete agreement on modification of the treaty under which the Pacific Fisheries Commission was established in 1953 could not at that time be reached. The meeting was adjourned with recommendations to the Governments that a fourth meeting be convened at a later date for the purpose of reaching final agreement.

International (Contd.):

At the October 1, 1964, meeting of the Canadian Parliament, Canada's Minister of Fisheries gave a report on the negotiations held in Ottawa for the revision of the North Pacific Fisheries Convention. In his statement the Minister said that the Canadian delegation put forward its best efforts to bring about an agreement, and that valuable progress had been made toward the solution of the remaining differences which he hoped would be reconciled at a later meeting. The statement of the Canadian Minister of Fisheries to the House of Commons follows:

"Mr. Speaker, hon. members will recall that when the estimates of the Department of Fisheries were before the house last week I promised that at the conclusion of negotiations which were taking place here in Ottawa among Canada, Japan and the United States for the revision of the north Pacific fisheries convention I might be able to make a statement to the house.

"At the opening session of the Ottawa negotiations I expressed the hope on behalf of the Canadian delegation that this third meeting of the parties to the international north Pacific fisheries convention would resolve the remaining differences and would culminate in a successful conclusion of the protracted negotiations. Three weeks of uninterrupted negotiations have brought the parties very close to agreement, but it has not been possible to reconcile all the remaining differences, and the delegations have agreed to a recess in the discussions in order to study and recommend to their respective governments other approaches to the unsolved problems.

"We had hoped that final agreement could have been reached for the revision of the existing convention which, of course, continues in force but which may be terminated upon twelve months' notice by one of the parties. At the same time we realize that the problems with which the delegations have been faced are very complex, and that all must be solved before agreeing on a convention which we hope will remain in force for many years. The frank and co-operative attitudes of the delegations have permitted much progress and encourage us to hope that we shall reach agreement at our next meeting.

"I should like to give, for the information of the house, a very brief résumé of the Canadian position. The salmon runs to our streams are of the very highest importance to the fisheries of Canada's Pacific coast. We believe that through scientific study, strict regulation and positive fish culture methods we have maintained these stocks which would otherwise have disappeared. We believe that the salmon resource can be greatly increased by the application of scientifically based techniques which are now emerging. But this maintenance and increase of the runs require not only that

we continue our intensive efforts in research, regulation and culture, but that we also continue, at considerable cost to our economy, the protection of our rivers from other uses which would make them unsuitable for salmon. To justify all these costs of maintaining and, we confidently expect, increasing the salmon resources the benefits must accrue to the Canadian economy.

"During the past three weeks much progress has been made toward agreement which would meet our needs in an acceptable manner. It seems that, on the one hand, the basis for the Canadian position is now well understood and is given sympathetic consideration. On the other hand we realize that recognition of our special interests must be contingent on continuation of our special efforts to maintain and increase the salmon stocks and on continued full utilization by our fishery, and that the situation must therefore be subject to review by the commission established by the convention. We have been very close to agreement which would embody these essential points.

"The greatest unsolved problem is concerned with conservation measures for those stocks of North American salmon which now are fished on the high seas. Although the problem applies especially to sockeye of Alaska origin, Canada has a potential interest in a solution which could be applied to other stocks fished on the high seas although to a much more minor degree. We are also concerned by the growing scientific evidence that the high seas fishing of salmon stocks which are intensively fished inshore may be wasteful.

"It appears that we are close to agreement on a formula which would be acceptable in so far as the major halibut producing areas are concerned. This formula would recognize the long history of research and regulation by the international Pacific halibut commission on behalf of the governments of Canada and the United States, and the resulting successful restoration and maintenance of the important halibut fishery. We had hoped that similar protection could be extended to other areas where the stocks have been the subject of similar study and regulation and are utilized by our fishermen. This must now be a matter for further discussion.

"Regarding herring, we hope that a satisfactory solution can be reached as herring is not of significant importance to Japan.

"To conclude, I am satisfied that the Canadian delegation, to whom I am very grateful, has put forward its best efforts to bring about agreement which would provide the greatest measure of protection to those Pacific coast fisheries which are the mainstay of our fishing industry in British Columbia. I am also encouraged by the valuable progress that has been made toward the solution of the remaining differences, and hope that these may finally be reconciled at the next meeting."

Note: See *Commercial Fisheries Review*, December 1964 p. 79; November 1964 p. 67; September 1964 p. 55.

International (Contd.):

INTERNATIONAL COUNCIL FOR THE
EXPLORATION OF THE SEASYMPOSIUM PLANNED ON ECOLOGY
OF PELAGIC FISH SPECIES
IN ARCTIC WATERS:

A Symposium on the Ecology of Pelagic Fish Species in Arctic Waters, planned by the International Council for the Exploration of the Sea (ICES), is scheduled to be held just prior to the Statutory Meeting of ICES in Copenhagen, Denmark, in the fall of 1966. The Symposium is to be held in accordance with recommendations made at the last two ICES meetings.

The Symposium is intended to mainly cover a number of species which, due to their only minor direct importance to the fishery and also to their living partly outside the range of the commercial fisheries, have been somewhat neglected in the research work. However, most of those species play, due to their great quantities, a considerable role as links in food chains and a few of them have become important to industrial fisheries.

The Symposium is planned to be limited to pelagic or semipelagic fish which inhabit or reach into the Arctic or sub-Arctic regions of the North Atlantic. Examples of such species are: Mallotus, Argentina, Osmerus (and possibly other salmonids); smaller gadoids as G. saida, G. esmarkii, G. ogac, G. navaga, G. poutassou; Ammodytes. Species of the herring, tuna, mackerel, and ocean perch (redfish) groups do not fall within the scope of the Symposium.

Although the Symposium is formally limited to the Arctic region, the ecology of those species in areas bordering the Arctic can also be included when necessary to ensure an adequate treatment of the subjects.

The Symposium is to be limited to include three subjects:

- (1) The species as links in food chains;
- (2) The species as basis for the fisheries; and
- (3) The distribution and migration of the species, and their effects upon the availability of commercial fishes.

Participation in the Symposium is not only open to the ICES member countries, but also

to others and invitations to participate are to be extended to Canada and the United States.

The deadline for acceptance of contributions by the ICES Secretariat is fixed for May 1, 1966, in order to make possible an advance distribution of papers to participants. To facilitate the prearrangement of the symposium, it is requested that the ICES Secretariat, where possible, be given notice of contributions (authors' names and titles) at an earlier date than May 1, 1966. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 11, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 68

CONVENTION ON FISHING AND CONSERVATION OF
LIVING RESOURCES OF THE HIGH SEAS

RATIFIED BY UGANDA:

Uganda deposited its ratification, on September 14, 1964, to the International Convention on Fishing and Conservation of Living Resources of the High Seas. This brings to 17 the number of nations which have deposited accession to the Convention. A total of 22 ratifications is needed before the Convention enters into force.

On the same date, Uganda also acceded to the Convention on the High Seas, the Convention on the Continental Shelf, and the Convention on the Territorial Sea and Contiguous Zone. Those Conventions entered into force on September 30, 1962, June 10, 1964, and September 10, 1964, respectively.

Note: See Commercial Fisheries Review, November 1964 p. 70; October 1964 p. 49.

ORGANIZATION FOR ECONOMIC
COOPERATION AND DEVELOPMENTSANITARY REGULATIONS FOR CANNED
FISH DRAFTED AT MEETING OF EXPERTS:

A meeting of experts on sanitary regulations and quality standards for canned fishery products was held by the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) at Paris, France, November 30-December 3, 1964.

The agenda included the following: (1) Drafting quality standards for (a) canned brisling, brisling sardines, and sprats; (b) canned smoked or unsmoked sild packed from young herring (Clupea harengus) as "sild-sardines" in oil, tomato sauce, or other packing media; (c) canned herring in tomato sauce, brine, or edible oil; (d) canned sardine in tomato sauce or oil; (e) other canned herring. (2) Drafting a Code of Practice.

International (Contd.):

The drafts were discussed and finalized by the experts attending the meeting. The final drafts are to be submitted to Member Countries and to the OECD Committee for Fisheries.

The North American consultant on this project, selected by both the United States and Canada, was Reginald Bolton of the Canadian Fisheries Inspection Service. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 10, 1964.)

UNITED NATIONS SPECIAL FUND

FISHERIES DEVELOPMENT PROJECTS:

Six United Nations Special Fund projects to aid fisheries are now in operation. Those projects are located in Peru (Marine Resources Research Institute), Ecuador (National Fisheries Institute), India (Central Institute of Fisheries Education), Nigeria (Fisheries Survey in the Western Region), Rhodesia (Lake Kariba Fisheries Institute), and Chile (Fisheries Development Institute).

Other fishery projects for individual countries were approved by the Special Fund in 1964 with the Food and Agriculture Organization (FAO) as the executing agency. Those are in Korea (Deep Sea Fishing Training Center), the Philippines (Deep Sea Fishing Development Project), and Aden (Gulf of Aden Fisheries Survey and Training Project). Preliminary plans for those projects have been prepared.

A regional project for fisheries development in the Caribbean area has also been approved by the Special Fund with FAO as the executing agency. A plan of operation for the project has been prepared and discussed with the participating countries.

Other fishery projects being considered by the Special Fund concern Ceylon, Pakistan, Argentina, Ghana, Central Africa (regional), and East Africa (regional). The proposed projects are mainly concerned with marine fisheries, although the East African regional project involves inland fisheries. (Information Bulletin of General Fisheries Council for the Mediterranean, July 1964.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 30; Nov. 1963 p. 58; Jan. 1963 p. 108; Sept. 1960 p. 50.

WHALING

JAPANESE VIEWS ON ANTARCTIC WHALING DEVELOPMENTS:

The following are Japanese press comments on Antarctic whaling developments and their possible effect on the 1964/65 season.

Norway and the Soviet Union held a meeting in Oslo, Norway, on or about October 19, 1964, to discuss the catch quota for the 19th Antarctic Whaling Expedition, reported the Japanese Government on October 31. Japan was not represented at that meeting. At the meeting of the two nations, Norway apparently agreed to an increase in the Soviet Union's whale catch quota, from 1,600 blue-whale units (representing 20 percent of the international whale catch quota) to a total of 2,000 units. This action not only increases the overall catch quota agreed to among the whaling countries for the 19th Expedition (1964/65 season), from 8,000 units to 8,400 units, but also upsets the international share agreement concluded among member countries.

The Soviet Union was expected to declare an increased catch quota of 2,000 units for the 1964/65 season, but Japan plans to harvest only 4,160 units, the amount allocated to her by agreement with other whaling nations. In a statement made to the press on October 22 concerning his objection to attending the meeting proposed by Norway, the President of the Japan Whaling Association declared that the Japanese industry is not excessively concerned about Soviet intentions. He stated that "even assuming that Norway had requested a meeting since she was afraid that the Soviet Union might increase her catch, the Japanese industry is not that concerned over such a development since it is the opinion of the whale scientists that the whale catch for the coming season will not exceed 8,500 units, even if additional effort should be employed." He added that Japan would operate within her agreed quota.

On October 23, Japanese Government sources revealed that on September 30, Japan had filed an objection with the International Whaling Commission's adoption (at the June 1964 Annual Meeting) of an amendment to the Whaling Convention which would entirely prohibit the catching of blue whale stocks in the Antarctic Ocean. The Convention has prohibited the harvesting of blue whales due to the serious decline of that stock observed in recent years, but permitted limited whaling

International (Contd.):

for pygmy blue whales within the area bounded by 0°-80° E. longitude and 40°-55° S. latitude. The amendment now nullifies that provision and completely restricts all blue whaling operations.

Japan contends that pygmy blue whales have shown no decline at all and sees no reason why the harvesting of that species should be prohibited. Citing the findings of the Commission's Scientific Committee that the pygmy blues could be taken for the next three years at the rate of about 400 units a year without jeopardizing that stock, Japan suggested the possibility of selective catching of that species within the area 30°-80° E. longitude and 40°-55° S. latitude. However, that proposal was rejected by the Commission. (*Nihon Suisan Shimbun*, November 2; *Suisan Keizai Shimbun*, October 23 & 24, 1964.)

According to the Japanese periodical *Nihon Suisan Shimbun*, the Government of Norway, which in response to the desire of the Soviet Union had proposed a meeting of the Antarctic pelagic whaling countries to seek adjustments in the catch quota established for the 19th Antarctic Whaling Expedition, has abandoned her efforts to convene that meeting. The meeting reportedly was cancelled due to Japan's refusal to take part in it, but the periodical claims that the aim of that meeting was to abolish the existing quota and to legally grant the Soviet Union a quota of 2,000 blue-whale units (increase of 400 units), so it was only natural for Japan to refuse to participate in that meeting.

The periodical goes on to state: "The fact that the proposed meeting failed to materialize means the end of the 8,000-unit catch quota informally adopted by the whaling nations for the coming whaling season. Thus, from the standpoint of the International Whaling Commission, the interpretation can be made that the existing international catch share of 52 percent for Japan, 28 percent for Norway, and 20 percent for the Soviet Union is no longer valid. For that reason, while Japan's persistent refusal to attend that meeting was unavoidable, it is conceivable that Japan's attitude may have placed her in a very unfavorable position internationally..."

"The 8,000-unit catch quota agreed to by the whaling countries, despite strong opposition from the Commission's nonwhaling coun-

tries, will again be slightly increased, and it can already be anticipated that the Commission, at next year's annual meeting, will criticize the attitude of the whaling countries, particularly Japan, as a result of the Soviet strategy. There is also a strong possibility that the Commission will seek to revise the international quota, since the three whaling countries have declared for the 19th Expedition catch targets not based on the international quota. Now that the whaling fleets have departed for the fishing grounds, the Japanese Government and industry must unite and develop countermeasures to cope with these problems." (*Nihon Suisan Shimbun*, October 30, 1964.)

Note: See *Commercial Fisheries Review*, September 1964 p. 54.



Australia

EXPORTS AND PRODUCTION OF SPINY LOBSTERS, AND TRENDS, FISCAL YEAR 1963/64:

Australia's exports of spiny lobster (tails, whole, cooked) in fiscal year 1963/64 (ended June 30, 1964) amounted to 10.7 million pounds with an estimated value of US\$13.5 million. The United States as the principal importer of Australian lobster tails took about 80 percent of those exports; France was in second place with about 16 percent.

While exports to the United States were down slightly from the previous year, those to France doubled--from about 865,000 pounds in 1962/63 to 1.7 million pounds in 1963/64. Exports to France were made up of 700,000

Table 1 - Australia's Exports of Spiny Lobsters--Tails and Cooked Whole, 1962/63-1963/64

Country	1/1963/64		1962/63	
	Tails	Whole	Tails	Whole
	(1,000 Lbs.)			
United States	8,290	216	8,745	501
France	750	951	123	742
Canada	272	-	57	-
South Africa	41	1	2	-
Singapore	28	67	11	77
Netherlands	4	-	8	-
Belgium-Luxembourg	2	17	-	6
Japan	2	11	-	-
German Federal Republic	-	13	-	10
Greece	4	4	-	1
Italy	-	29	3	15
Arabian States	7	-	7	1
New Caledonia	5	4	5	4
Other	11	13	41	23
Total	9,416	1,326	9,002	1,380

1/Subject to revision.

Australia (Contd.):

pounds of tails and 1 million pounds of whole lobster, with a total value of \$1.6 million.

The average price per pound for spiny lobster exported to all countries during the period was about \$1.30 for tails and about 73 cents for whole lobster. Exports to the

A new trend in spiny lobster grade patterns is indicated in Western Australia. Midget lobster which accounted for 18 percent of the tails exported in 1962/63 now account for 24 percent. On the other hand, medium tails which are popular in the United States fell from 28 to 25 percent, while large and jumbo sizes combined dropped from 21 to 18 percent. Jumbo tails which formerly brought

Table 2 - Australia's Exports of Spiny Lobsters by States, 1960/61-1963/64

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Total
	(1,000 Lbs.)						
1963/64: Tails ..	63	481	32	743	7,834	263	9,416
Whole ^{1/} ..	17	271	17	180	813	28	1,326
1962/63: Tails ..	7	529	-	573	7,690	203	9,002
Whole ..	15	348	-	44	797	176	1,380
1961/62: Tails ..	115	855	42	524	7,947	392	9,875
Whole ..	8	64	9	-	419	13	513
1960/61: Tails ..	100	563	-	186	5,047	127	6,023
Whole ..	208	353	-	6	1,017	199	1,783

^{1/}Estimated.

Table 3 - Australia's Spiny Lobster Production, 1957/58-1963/64

	New South Wales	Victoria ^{1/}	Queensland	South Australia	Western Australia	Tasmania ^{1/}	Total
	(1,000 Lbs.)						
1963/64 ^{2/} ..	400	940	10	4,050	21,500	3,750	30,650
1962/63 ..	491	1,080	31	4,650	3/21,380	3,761	31,393
1961/62 ..	384	1,138	58	4,025	3/19,772	3,964	29,341
1960/61 ..	467	1,266	41	3,721	18,019	3,971	27,485
1959/60 ..	492	830	40	3,500	19,545	3,601	28,008
1958/59 ..	461	823	25	4,250	17,517	3,226	26,302
1957/58 ..	525	636	23	4,460	13,327	2,993	21,964

^{1/}Catch by Victorian fishermen in Tasmanian waters has been included in Tasmania.

^{2/}Estimated.

^{3/}Partly estimated.

Source: 1957-58 to 1962-63, Commonwealth Statistician; 1963-64, State Fisheries.

United States during the period averaged about \$1.35 a pound for tails.

Five years ago the United States took about 90 percent by weight of the total Australian spiny lobster exports. But the trend in recent years has been toward greater market diversification. While the United States takes the main portion of the exports, Australia has increased its spiny lobster exports to France, Canada, and other countries. Although high prices and less dependence on the United States has strengthened the market for spiny lobster, indications are that Australian production may not keep pace with the demand.

Australian spiny lobster production in 1963/64 was estimated to be 30.7 million pounds (live weight), a decline of about 2 percent from the previous year. The most productive state was Western Australia, which accounted for about 21.5 million pounds or 70 percent of the total production.

lower prices are now selling at close to the top of the market. (Australian Fisheries Newsletter, October 1964.)

Note: See Commercial Fisheries Review, December 1963 p. 54

ARTIFICIAL CULTIVATION OF SPINY LOBSTER TO BE TRIED:

An attempt to breed and artificially cultivate spiny lobster in Western Australia is being considered by private enterprise. A proposal has been submitted to the Western Australian Department of Fisheries to build a fish farm on the coast. It involves the excavation of a pool with stone retaining walls which will contain ledges and caves at various depths for spiny lobster. It is planned to introduce other marine life and to supply sea water through a pipe by gravity feed.

Fisheries Department research officers consider it will be difficult to induce spiny lob-

Australia (Contd.):

ster to spawn in an artificial pond, but believe that the young ones may survive and grow if artificially fed.

Shrimp farming, using artificial propagation methods, has been successfully developed in Japan, but it has taken many years of research to develop the techniques. (Australian Fisheries Newsletter, September 1964.)

NORTH QUEENSLAND SHRIMP BEDS PRODUCTIVE:

Shrimp beds in the Burdekin Estuary area of North Queensland, Australia, yielded good catches of shrimp in September 1964. Six vessels were working the area and the shrimp were marketed from Mackay to Cairns. Daily catches of more than 3,000 pounds were landed at Townsville. The North Queensland Fish Marketing Research Authority has been asking for local surveys by local vessels in an endeavor to discover more shrimp beds in North Queensland. (Australian Fisheries Newsletter, September 1964.)

SHRIMP RESOURCES IN NORTHERN WATERS SURVEYED:

A two-year survey of the shrimp fishery potential of the Gulf of Carpentaria on Australia's north coast was approved in 1962 for expenditures of up to £25,000 (US\$56,000) from Australia's Fisheries Development Trust Account. The survey was to be conducted jointly with the state government of Queensland.

A survey vessel has been operating in the Gulf of Carpentaria for nearly 12 months and a considerable amount of data on the occurrence of various species of shrimp has been collected. The data have given several interesting leads as to the best method of continuing efforts in the Gulf to locate commercial quantities of the various shrimp species.

The Australian commercial fishing company which has established shore-processing facilities in the area has been working in close cooperation with the survey. Commercial catches have been made on a scale which would, if sustainable, indicate a major shrimp fishery. But the very great area to be covered and the limitations in using only one ves-

sel have not made a definitive assessment of the shrimp resource possible.

The supervising committee, in making a review on progress of the survey, concluded that although the survey vessel has caught shrimp in commercial quantities on only a few occasions, encouraging evidence of abundance of banana and tiger shrimp has been obtained. The knowledge which has now been acquired from the survey indicates commercial success in 1965. (Australian Fisheries Newsletter, September 1964.)

FOREIGN TRADE IN FISHERY PRODUCTS, FISCAL YEAR 1963/64:

Exports: The value of Australian exports of fishery products in fiscal year 1963/64 (July 1963-June 1964) rose to a record A£8,266,000 (US\$18,350,520), according to preliminary data. That was an increase of 12 percent from the previous fiscal year. The main reasons for the increase were improved prices for Australian spiny lobster tails in the United States, expansion of the scallop market in France, and an increase in frozen tuna exports to the United States.

Shipments to the United States accounted for 64 percent of total Australian exports of fishery products in 1963/64, shipments to France and Japan each accounted for 11 percent, and shipments to the United Kingdom accounted for 6 percent.

The increase in United States spiny lobster prices was largely the result of a significant fall in United States spiny lobster inventories. On June 30, 1964, those were estimated at 3.5 million pounds, which was 47 percent lower than in June 1963. (Editor's Note: United States cold-storage holdings of spiny lobsters on September 30, 1964, were about 2.6 million pounds as compared with 5.1 million pounds on September 30, 1963. In the first 8 months of 1964, United States imports of frozen spiny lobsters included 7.6 million pounds from Australia, 8.6 million pounds from the South Africa Republic, 1.9 million pounds from New Zealand, 1.8 million pounds from Brazil, and about 5.3 million pounds from other countries. During January-August 1963, United States imports of spiny lobster tails included 8.2 million pounds from Australia, 7.0 million pounds from the South Africa Republic, 2.2 million pounds from New Zealand, 2.7 million

Australia (Contd.):

pounds from Brazil, and about 4.1 million pounds from other countries.)

Australian shrimp exports in 1963/64 went to Japan, the United States, and South Africa.

It is estimated that more than 750,000 pounds of scallops valued at about A£185,000 (\$410,700) were exported from Australia in 1963/64, of which 655,000 pounds went to France, and the balance to Belgium, the United Kingdom, and New Caledonia.

Imports: The value of Australian imports of fishery products in fiscal year 1963/64 was 24 percent above that in the previous fiscal year. The largest increase was in imports of fresh and frozen fish, the bulk of which was South African hake, and British bream and cod packed in 1-pound and 5-pound cartons.

Australian Imports of Fishery Products, Fiscal Year 1963/64				
Item	Value			
	1963/64		1962/63	
	A£1,000	US\$1,000	A£1,000	US\$1,000
Fresh and frozen fishery products.	5,187	11,515	3,822	8,485
Canned fishery products	4,683	10,396	4,039	8,967
Other fishery products	1,221	2,711	1,070	2,375
Total	11,091	24,622	8,931	19,827

In fiscal year 1963/64, Australian fishery imports exceeded fishery exports in value by 34 percent. (Australian Fisheries Newsletter, September 1964.)

Notes: (1) See Commercial Fisheries Review, Oct. 1964 p. 51.
(2) Australian pound 1.00 equals US\$2.20.



Canada

HERRING FISHING IN BRITISH COLUMBIA HALTED BY PRICE DISPUTE:

British Columbia herring fishing was halted in late October 1964 by a price dispute. The tie-up came a week after the expiration of the 1963/64 Herring Price Agreement between British Columbia fishermen and processors. Before the tie-up began, processors were reported to have offered fishermen C\$14 (about US\$13) per short ton for reduction herring, or C\$1.60 (US\$1.48) more than the C\$12.40 (US\$11.48) paid for British Columbia herring going into reduction during

the 1963/64 season. The processors also offered to contribute to a medical plan for fishermen during the coming season. (Editor's Note: Ex-vessel prices for herring in British Columbia are not comparable to prices in certain other countries, because British Columbia processors furnish much of the equipment used in the fishery.)

Note: US\$1.00 equals Canadian \$1.08.

FISHERIES MINISTER REPORTS TO PARLIAMENT ON FISHING INDUSTRY PROGRESS IN 1964:

Canada's commercial fishery in 1964 was generally satisfactory, according to the annual report given by the Canadian Minister of Fisheries to Parliament, September 23, 1964. The spring salmon fishery in British Columbia yielded 4.9 million pounds in the first 6 months of 1964 as compared with 3.6 million pounds for the same period in 1963. For the first 7 months in 1964, landings of all species by Canada's commercial fishermen on both coasts totaled 1.2 billion pounds--30 million pounds more than in the same 7 months a year earlier. Despite the overall increase, cod landings from Newfoundland's trap fishery were below 1963 and contributed to a 48-million-pound decline in Canadian landings of that species.

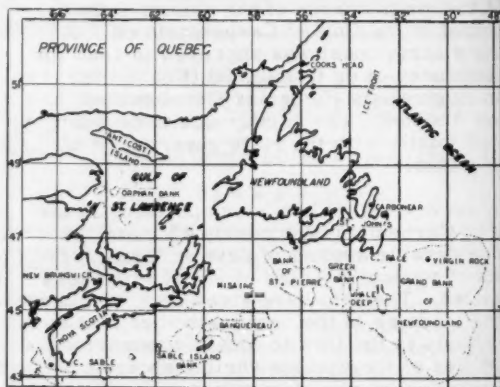


Fig. 1 - Canadian fishermen are close to rich fishing banks off the Atlantic Coast.

In his annual report to Parliament, the Minister of Fisheries said, in part:

"The value of the commercial catch is larger so far this year than the increase in landings would suggest. The increase in value to the end of July was about 20 percent against 2 percent increase in the volume of landings. This is accounted for principally by a high-

Canada (Contd.):

er proportion of the more valuable species in the total catch. In British Columbia, salmon landings are up by 34 million pounds, and in the Atlantic provinces there have been significant increases in the landings of haddock, small flat fish, swordfish, and scallops....

"This expansion in output at the primary level of the industry occurred without any softening of dockside prices. In fact, in some cases the price level moved up over the record level set a year ago....



Fig. 2 - "Seining the weir" (concentrating the fish into a mass by gradually decreasing the net space) in a 60-foot sardine weir off the Atlantic Coast.

"In the Maritime Provinces the expansion in production and quality of swordfish and tuna, the last just a two-year-old industry, continues.... The United States is the predominant market for these special species. This year the value of scallop landings is up by C\$900,000 and swordfish by \$600,000 over the last season....

"The halibut catch, however, has been disappointing, especially from area 2, but prices have firmed up considerably from last year....

"The value of exports to the end of June indicates a continuing strong demand for fishery products from this country. For all products, this figure for the six months period was C\$88 million, compared with \$72 million to the end of June 1963. The United States continues to be the largest customer in this field and Canadian exporters sold \$58 million worth out of the \$88 million total to markets in the United States.

"The demand for groundfish products continues without abatement....

"The strong demand for Canadian fishery products, and especially that associated with the growing population on this continent, has been accompanied by firm or rising prices. This situation has been apparent for

several years.... The Atlantic fleet now includes 92 trawlers, most of which are modern and efficient. Five years ago this fleet comprised 53 vessels. This is an increase of 80 percent, and most of the 53 were used ships which had been purchased from the United Kingdom and the United States. The scallop fleet now contains about 35 vessels over 75 feet in length, capable of exploiting distant beds and landing scallops of high quality. Five years ago there were only 9 scallop vessels of this size on the Atlantic coast. Fishermen, alone or in partnerships, are acquiring vessels in the 45- to 65-foot class which fish near and middle distance waters. They are equipped with modern fish-location and catching gear, and their owners are actively experimenting with new types of gear and new methods of fishing. Nearly 500 of these vessels have been purchased by fishermen with financial assistance provided by the Department of Fisheries in recent years.

"Significant advances have been made by industry in providing facilities to increase their processing capacity and to expand the variety of fish and shellfish products available to an increasingly quality conscious public.... Complementary to the development program for improved product quality at the processing level has been the Department's work in the fields of fishboat inspection and dockside grading. As an outcome of the Federal-provincial conference on fisheries development, which pointed to the need for improvement in the quality of fish as landed, more emphasis has been placed on these aspects of inspection. Regulations are being developed for adequate sanitation and handling methods on fishing boats. Educational material is being prepared for the assistance of fishermen in handling and caring for their catch, and also for those handling fish at the retail level.



Fig. 3 - Irish moss is harvested on parts of Canada's Atlantic Coast. Raked up from the sea, the seaweed is spread to dry on flakes (wooden racks).

"The Department's laboratories are responsible for the inspection of domestic and imported canned fish; experimental work on the development of new and improved standards for canned and other types of fish; shellfish toxicity control programs; the bacteriological control of fresh and frozen shellfish plants and the purity of plant water supplies. These services are provided by permanent or mobile laboratories as the need dictates....

National Fisheries Development Program: In speaking of Canada's national fisheries development program, the Minister said, "I have already mentioned in this house our national fisheries development program, the basis of which was set up at a Federal-provincial conference on fisheries development which I convened in Ottawa last January (1964). I explained, too, that this

Canada (Contd.):

was also a forum for the views of industry as well as of Government, since briefs were received at that time from the Fisheries Council of Canada and from fishermen's representatives from various areas.

"The progress made as a result of this conference is quite heartening, and I think this is the proper time and place to report on it. A number of projects are now well under way as cooperative efforts between Federal and provincial administrations. These include the following:

"1. The development and demonstration of trawls suitable for rough bottom, so that our Canadian fishermen can exploit grounds now being actively fished by foreign vessels.

"2. The modification of small boats for inshore dragging and introduction of Japanese-type mechanical squid jigging equipment--this is in the Newfoundland area.

"3. Demonstration of the construction and operation of the western or Pacific trawl in Nova Scotia and New Brunswick waters.

"8. Experimental and development work in Quebec on fish-finding gear towed by helicopter.

"9. The development and introduction of improved lobster processing line techniques in Quebec plants.

"10. Work in collaboration with ARDA on a project to improve the inshore fishery in northeastern Newfoundland.

"During the conference it became obvious that there was a need for regional Federal-provincial committees similar in concept to the Federal-provincial Atlantic fisheries committee which was established in 1958 to coordinate programs for fisheries development, and the Federal-provincial committee for Ontario fisheries. Consequently we now have a Federal-provincial committee for British Columbia fisheries and a Federal-provincial prairie fisheries committee. All these Federal-provincial regional committees are of inestimable value in that they constitute formal consultative bodies which can discuss and deal with questions of common interest such as marketing, research and fisheries management generally. A sport fishery advisory committee has also been established in British Columbia. . . .

"Restriction of entry into the lobster fishery has been considered at regional Federal-provincial meetings; so has the subject of limitation of entry into the Pacific

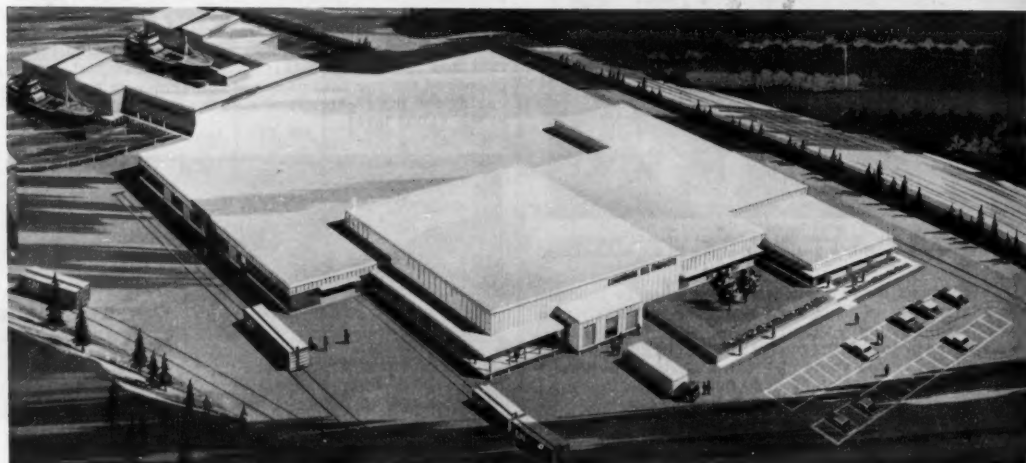


Fig. 4 - New fish-processing plant in Lunenburg, Nova Scotia. Designed to efficiently handle fish by a system of conveyor belts from the vessel unloading pier to the final freezing of the packaged processed fish products. Vessel unloading facilities are completely enclosed.

"4. The charter of a Norwegian whaling vessel, with her crew, to learn and to demonstrate the possibilities of reviving the whaling industry on the Atlantic coast.

"5. The improvement of trawling operations for groundfish off the Pacific coast.

"6. A survey is being made of the Irish moss resources in New Brunswick and Prince Edward Island and a few days ago I made the announcement that a site had been selected on Prince Edward Island for the construction, with assistance from the Atlantic development board, of an Irish moss drying plant.

"7. The exploration of a new scallop bed off Shipagan gully.

salmon fisheries, and there have been discussions on fish farming, in particular, with respect to commercial trout farms. A good deal of background material on this subject has been prepared and these matters are under active consideration.

"The control of pollution of our waters remains a subject of vital interest and much information has been collected. The fisheries research board has been in consultation with the national research council concerning the establishment of an intergovernmental committee on pollution to ensure the availability of complete information. It is hoped that work on salt-water pollution in the Atlantic region can be started and that the work already carried out on the Pacific coast can be strengthened.

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"Discussions have taken place with the Department of Labor and with provincial authorities on vocational training and education for fishermen, and my department is creating an educational unit to coordinate activities in this connection.

"Then again, as a result of recommendations made during the Federal-provincial conference, a fisheries-related approach to improvements in harbor works has been discussed with the Department of Public Works and the Atlantic development board. Discussions have also taken place with the Department of Finance concerning improvements to the Fisheries Improvement Loans Act. The provincial authorities and the industry are being asked for their views concerning credit facilities for fishermen and possible inadequacies in the existing legislation."

Other Federal Government Fisheries Projects: In reporting to the Parliament on other Canadian Federal Government fisheries projects, the Minister said, "In addition to the programs already mentioned, many other industrial development projects are under way. Powered gill-net haulers are being introduced, synthetic cod gill nets are being tested in areas where they have not been used, and we are experimenting with synthetic materials for cod trap construction. We are also working on a prototype of a mechanized gill-net boat capable of multipurpose fishing operations, and we have introduced porbeagle shark fishing gear and techniques in the Atlantic provinces.

"Modern methods of seining herring in western and southern Newfoundland also are being demonstrated to ascertain the commercial potential of such operations in those areas. New techniques in salt-fish drying, using high-speed equipment developed in the department, are being demonstrated on a commercial scale for the benefit of industry, and we are producing, on a pilot plant basis, commercially acceptable instant fish-potato flakes.



Fig. 5 - A Canadian West Coast purse-seiner sailing out to seek the schools of salmon.

"We are working on a design of a deep-sea stern ramp trawler to meet the specific Canadian requirements for groundfish trawling operations and are experimenting with an electrical trawl.

"In Nova Scotia we are studying the distribution and abundance of herring, whiting, argentines, and sand lance, which are species of small fish not yet exploit-

ed by Canadian fishermen. The object is to develop offshore trawling gear and techniques so that this situation may be remedied. Scottish methods of Danish seining are being tested to increase the efficiency of this technique, and we are hoping to develop a distant-water tuna fishery, using large seine boats.

"A new and promising design for a plastic lobster trap is being tried out on a commercial scale in Prince Edward Island where we also hope to encourage offshore herring seining methods, like those used in Iceland, in order to meet European orders for frozen herring. We are aware of the great potentialities of fishing for pelagic fish in the Gulf of St. Lawrence and we are prepared to meet this challenge. Crab fishing operations are under way in the Northumberland strait, and we are hoping that a crab fishery can be developed around the Magdalen and Anticosti Islands. We anticipate good results from a manually operated hydraulic clam digger developed by the fisheries research board for clam beds in the maritimes.

"In British Columbia one of our aims is to diversify fishing operations off the Pacific coast by the introduction of better trawling operations for groundfish, and we are working on an improved refrigeration system for use in the halibut fishery in distant areas."

Fishing Limits: Referring to the establishment, on July 23, 1964, of a 12-mile fishing zone around the coasts of Canada, the Minister told the House the next step was the establishment of straight base lines from which the 12-mile fishing zone and the territorial limits would be measured. They are now measured from the contour of the coastline.

Eight other countries, the Minister pointed out, have been fishing off Canada's coastline for some time and discussions were being held with those countries to see how their interests might be affected. Those discussions were in their second round as of late September 1964 and the Minister hoped for their early conclusion so that new base lines could be established without delay. (Canadian Fisherman, November 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 79; October 1964 p. 52; March 1964 p. 42; January 1964 p. 44.

DOME-SHAPED LOBSTER TRAP DESIGNED WITH UNIQUE FEATURES:

A new dome-shaped "igloo" lobster trap made of plastic has been developed by the Markland Works, Ltd., Amherst, Nova Scotia. That firm was set up for the sole purpose of manufacturing and marketing the new trap. A large-scale test of the new trap is scheduled in fishing areas off Prince Edward Island. Preliminary tests in the lobster fishery have already been carried out; tests in the west coast crab fishery of British Columbia have also been conducted.

The new plastic traps are expected to have an effective working life of from 8 to 10 years. In addition, it is claimed that their shape and weighting make them more stable on the sea bottom than other traps.

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The polyethylene plastic material in the new traps will not rot or waterlog and is not attacked by marine borers or other forms of sea life. In the water, it has the same smooth resilient feel as kelp, a natural sea plant on the lobster grounds. Polyethylene used in the traps is pigmented to reduce the danger of sunlight degradation when the traps are stored in the off-season.



Fig. 1 - New plastic "igloo" lobster traps compared with conventional wood-and-twine traps. Here, 32 of the new compact traps are piled in front of the same number of conventional traps. That number of new traps occupies the same space as four conventional traps. White objects are bait boxes for the new traps.

The trap is dome-shaped--hence the name "igloo"--with a vertical entry for the lobster. This design gives the trap greater bottom sta-



Fig. 2 - Plastic traps are loaded on lobster fishing vessel at Victoria, P.E.I., Canada. The "igloo" traps snap apart easily for storage, and can be assembled in seconds. They are weighted with a coated iron ring which helps them sit firmly on the bottom.

bility and allows lobsters direct access to the entry from any direction of approach. The entry itself is at the top of the dome and closer to the bait than any other point in the trap.

The entry consists of thin fingers of polyethylene leading into the trap. The fingers are resilient and can easily be spread apart by a lobster attempting to enter. When the lobster is inside, however, the fingers spring back into place closing off the entry. The opening can be spread to nine inches to trap much larger lobsters than present traps. Once the lobster is in the new trap, it stays in. There is no chance for it to spread the fingers from inside and escape. A small exit port is left in the side to allow undersized lobsters to escape.



Fig. 3 - Lobster fisherman assembles an "igloo" trap on the way to the lobster grounds. The traps have a twist-on bait box that can take whole fish bait or mashed or chopped fish waste. The bait box prevents groundfish or crabs from stealing the bait before the trap can attract lobsters.

The "igloo" trap also has a specially designed quick-release bait container, made to hold either whole or mashed bait. The new bait box allows fishermen to use cheap fish trimmings and other low-cost bait. It also prevents fish from eating the bait before it has a chance to attract lobsters.

"Igloo" traps come in four sections which can easily be fitted together. The base section has a mild steel weight ring snapped into it with a tow eye welded to the ring. The steel ring is coated with epoxy plastic to prevent rusting and the tow eye is made of a special salt-water-resistant steel. The bait box snaps into the center of the base and twists on so that it is securely fastened. The dome-shaped body of the trap twists onto the base and is held by mating lugs. The top section with the

Canada (Contd.):

entry port is hinged to the body and closes with two latches.

Each part can be nested separately when transported and a trap can be baited and assembled in seconds. The nesting feature will allow a standard Canadian lobster boat to place 300 to 350 "igloo" traps without returning to port for another load.



Fig. 4 - Lobster fisherman throws an "igloo" trap overboard. Weighing 25 pounds, the plastic traps are lighter than conventional traps which can weigh up to 100 pounds when water soaked. The new traps weigh about the same as the wooden traps on the bottom, 19 pounds, because of their lower buoyancy. The iron ring at the base distributes the weight around the circumference of the "igloo" trap giving it stability on the bottom.

"Igloo" traps weigh 20 to 21 pounds on the bottom and 25 pounds in air, compared to 20 to 25 pounds on the bottom and up to 100 pounds in air for conventional traps. The top and bait box of an "igloo" trap open in seconds for baiting. When the lid is open there is ready access to the catch.

Because of their dome shape and ballast arrangement, the new traps settle in an upright position on the seabed. The slight buoyancy of the plastic keeps the top upright as the traps settle. (DuPont of Canada, Ltd., November 1964.)

EXPERIMENTAL OYSTER HATCHERY OPENED ON PRINCE EDWARD ISLAND:

Canada's first experimental oyster hatchery was officially opened in the summer of 1964 at Ellerslie, P.E.I., on the east coast. The hatchery, operated by the Canadian Federal Department of Fisheries, is designed to spawn oysters at any time during the year and to raise young oyster larvae to the stage where they settle down on the sea bottom as spat. The main purpose of the new facility is to produce spat in sufficient quantity to supply the oyster industry.

Spawning at the new hatchery is regulated by careful control of salinity, temperature, and other conditions. For example, the water in oyster tanks is heated in the winter and, at times, cooled during the summer.

The new hatchery also has an oyster-breeding program designed to improve growth, shape, flavor, and other characteristics of Atlantic oysters. Exotic species of oysters living in locations where commercial oysters cannot survive will also be tested in the hatchery.

While the study and raising of oysters are the main concerns of the hatchery, it will also study related subjects. For instance, oyster scientists are taking a closer look at eel grass, a marine flowering plant which is a serious menace in some oyster-growing areas. Methods for its control are being sought. The effects of pollution on oysters are also under study. Scientists at the hatchery are also seeking methods to control shipworm, a species of shellfish which attacks hulls of wooden vessels and other wooden structures in water.

Speaking at the opening of the new hatchery, the Canadian Federal Minister of Fisheries said there was every reason to give the Canadian oyster industry technical support to help it expand. He recalled the heavy mortalities suffered by Prince Edward Island oyster stocks more than 40 years ago when an epidemic struck the beds. Research scientists took over the problem and were able to use isolated pockets of resistant stocks to bring back the industry to the island.

The Minister also recalled the epidemic which devastated oyster beds in New Brunswick and Nova Scotia within the last decade. Quick action was taken by the Federal Department of Fisheries and more than 10,000 barrels of disease-resistant island oysters were transplanted in the affected areas on the mainland. "In general," he said, "these oysters lived and grew in the new areas, and they produced spat which in most cases was resistant, and the industry is now rebuilding."

The Minister declared that if the industry was to expand, it would have to be mainly through leased fishing areas where beds can be properly seeded and cultivated, and a top quality product harvested. (Canadian Trade News, September 1964.)

NEW RESEARCH VESSEL "E. E. PRINCE" TO BE BUILT FOR ATLANTIC INVESTIGATIONS:

A contract to build a million-dollar research vessel for Atlantic fisheries investigations has been awarded by the Canadian Federal Department of Fisheries to a shipyard in the St. Catharines, Ontario, area. The contract calls for a 130-foot vessel with a range of 3,000 miles and a cruising speed of 11 knots. The vessel will be equipped for stern trawling and scallop dredging. It will have a 27-foot beam, a draft of 10½ feet and a complement of 21 including scientists and crew.

The new research vessel will be named the E. E. Prince after the late Professor Ernest E. Prince, who was the first chairman of the

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Biological Board of Canada, which later became the Fisheries Research Board.

The E. E. Prince will have an antirolling flume-stabilization system to help steady the vessel while operating at sea; it will also have a bow-thruster installed well below the low-water line to aid slow-speed maneuvering.

The all-welded steel hull of the vessel will be strengthened for navigation in ice, and the deckhouse and wheelhouse amidships will be of aluminum. Propulsion machinery will be amidships. The fish hold and fishing gear will be located on the upper deck aft, which will be wood-sheathed.

Hinged gallows of special design will be installed for lowering and retrieving trawls. Two hydraulic trawl winches, each capable of exerting a pull of 4 tons at 240 feet per minute, will be fitted to operate in synchronization or independently as required. A winch for taking oceanographic samples will also be installed. Navigational aids to be installed include 2 radar sets, gyro compass, automatic pilot, 3 echo-sounders, and radio-navigational systems. The propulsion machinery will consist of a 600-horsepower Diesel engine coupled to a 4-blade controllable-pitch propeller. Electric power will be provided by three Diesel-driven generators. (Canadian Department of Fisheries, November 23, 1964.)



Chile

TUNA EXPORT INDUSTRY PLANNED:

To develop an export tuna industry, Chile is building a modern fish canning and freezing plant at Iquique. The Government-owned plant is expected to process between 25,000 and 30,000 metric tons of tuna, bonito, and sardines annually (mostly for export). The anticipated opening of the new plant has been delayed; it will probably not be in operation before the first quarter of 1965. The new plant, with its 3 automatic canning lines, will be capable of an annual production of 400,000 cases of tuna (48 1/2-pound tins) and 360,000 cases of Spanish sardines (48 1-pound tins). The cold-storage capacity of the new plant will be 100,000 tons of fish; freezing facilities will consist of a blast-freezing room and a brine-freezing installation. The new enterprise also includes a fish meal plant which began operating in June 1964.

The supporting fleet for the new plant will be composed of 8 tuna vessels and 9 anchoveta vessels. The anchoveta fleet is already working. The first vessel of the tuna fleet, the 170-ton Santa Rosa, started fishing in December 1962. (The company has used the cold-storage facilities of another plant to process frozen tuna and bonito from the Santa Rosa for export.) Two 310-ton vessels, acquired from Great Britain, were expected to join the Santa Rosa in late 1964. Five

110-ton purse seiners were ordered from German shipyards for the tuna fleet. Those vessels are scheduled for completion and delivery in late 1964.

Organized by the Production Development Corporation of Chile (CORFO), the new company at Iquique will be Chile's first modern fish canning-freezing plant. Chile tightened its control of fishing permits to foreign tuna vessels, with the idea of maintaining adequate resources for its own tuna industry. The Government is also concerned over the proposed yellowfin tuna conservation program of the Inter-American Tropical Tuna Commission.

The new Government-owned cannery at Iquique will bring mechanization to the Chilean fish canning industry. The four relatively small canneries now in operation in north Chile produce for the domestic market. None is fully automatic and only one has refrigeration facilities. However, those plants produce all the tuna and bonito and about 40 percent of the sardine and salmon-type fish canned in Chile. (United States Embassy, Santiago, October 29, 1964.)

* * * * *

FISHERIES TRENDS.

THIRD QUARTER 1964:

Landings of anchoveta from Chile's northern waters were rather light during July-September 1964 (usually considered an off-season period), but were considerably improved compared with the same period in 1963 when the anchoveta virtually disappeared from those waters. But the fish caught during the 1964 season were thin and their oil content very low. Although fish supplies were low, most industrial products plants continued to operate during the period.

Some of the larger vessels of the anchoveta fleet fished off Mejillones, a fishing area of the Antofagasta canneries. This incursion into that area by those larger anchoveta fishing vessels was protested on the grounds that some of the commercial species taken by them were too valuable to use for fish meal.

Chile's anchoveta landings in the first half of 1964 exceeded total landings of that species in 1963. By the end of 1964, the fish reduction industry of northern Chile will have installed a production capacity nearing 900 metric tons of raw fish per hour. The 1964 export value of fish meal and fish oil was expected to amount to some US\$30 million.

The frozen shrimp and langostino industry of central Chile is expanding its processing facilities as well as modernizing them. Within the next year there should be a substantial increase in exports of frozen shrimp and langostino (baby rock lobster-type meat). Two new plants are under construction and three existing plants are installing new processing lines. The plants have modernized

Chile (Contd.):

their facilities and have better handling procedures in order to improve and increase production. (United States Embassy, Santiago, October 21, 1964.)

FISH MEAL AND OIL PRODUCTION ESTIMATE FOR 1964 AND OUTLOOK FOR 1965:

The dynamic development of the fish reduction industry in northern Chile over the last few years has placed Chile among the major fishing nations of the world. The reduction industry in northern Chile represents a capital investment of around US\$75 million. Chilean output could reach 455,000 metric tons of fish meal and 60,000 tons of fish oil in 1965.

The Chilean industry has been going through some readjustment. The explosive expansion of late 1962 and early



Fish meal being put in bags at a plant in San Antonio, Chile.

1963 was arrested by an almost complete disappearance of anchoveta from Chilean coastal waters from June through November 1963. Speculative and inexperienced capital was frightened out of the industry. The more sober pace of present growth offers greater assurance of a strong Chilean reduction industry.

Plant Capacity: As of July 1964, a total of 24 Chilean reduction plants were in operation in the northern Province of Tarapaca with a combined capacity of some 680 metric tons of raw material per hour. Twelve of those plants went into production during the first half of 1964. Under construction in Tarapaca in mid-1964 were 12 new plants and 7 new lines in existing plants. The facilities being built should boost the capacity of the Chilean reduction industry to about 1,200 tons of raw material per hour by 1965.

Production: In 1963, northern Chile produced 93,000 metric tons of fish meal and 12,300 tons of fish oil which represented 86 percent and 98 percent, respectively, of the total production of the country. The entire output of northern Chile was sold on the world market. Production in the first 6 months of 1964 amounted to 110,000 tons of fish meal and 13,600 tons of fish oil. Assuming 80 days of normal operations for the last half of 1964, production for the year should total some 255,000 tons of fish meal and 35,000 tons of fish oil. At prevailing prices, that production would have a total export value of \$30 million to \$35 million. In 1965, production could reach 455,000 tons of meal and 60,000 tons of oil. At prevailing prices, its value on the world market would amount to some \$55 million to \$60 million.

Fishing Fleet: The supporting anchoveta fleet of north Chile numbered 205 vessels as of July 15, 1964, an increase of about 100 vessels within the year. With few exceptions the fleet is composed of modern steel purse seiners having a hold capacity of 100 to 170 tons and equipped with echosounder, radiotelephone, power block, anchor winch, and a

Diesel-powered skiff. Many of the larger craft have fish pumps for emptying the nets.

The fleet is supported by a group of spotter planes which effectively cover the 200 miles of coastline from Arica to Iquique. Several planes are being used to direct net setting and hauling.

Anchoveta Catch: The northern fleet of Chile increased its catch of anchoveta (*Engraulis ringens*), the commercial fish of the reduction industry, from 438,000 metric tons in 1962 to 538,000 tons in 1963 (in spite of an almost complete disappearance of anchoveta from Chilean coastal waters for approximately 6 months in 1963). Landings in the first 6 months of 1964 reached 608,000 tons, a 55 percent increase over the catch during the same period of 1963. However, to support normal operations of the expanded reduction industry, the fleet must bring its total take for 1964 to 1,450,000 tons of fish. Installed plant capacity in 1965 will require between 2.3 million and 2.5 million tons of fish. If anchoveta are within reach, the present fleet is considered capable of supporting the normal production of existing plants. In 1965, a fleet of 250 to 275 vessels will be required to adequately supply the installed capacity.

Costs: Production costs have increased over 1963, but (with the very favorable world market for both fish meal and fish oil) earnings appear to be substantially better. In the Arica and Iquique zones, the cost of producing fish meal is around \$80 to \$90 per ton. The landed cost of the anchoveta continues around 10 percent of the f.o.b. value of fish meal. The October 1964 price of fish meal was \$125 f.o.b. Chilean ports.

Exports: The fish reduction industry of north Chile has been developed for the export market. (Domestic requirements of some 23,000 tons of fish meal are supplied by the higher-cost producers of south central Chile.) Chile's exports of fish meal in 1963 totaled 86,800 tons valued at \$9.3 million as compared with fish meal exports of 41,500 tons valued at \$3.5 million in 1961. Fish oil exports in 1963 totaled 11,800 tons valued at \$1.3 million bringing exchange earnings of the fish reduction industry to \$10.6 million. Plants outside north Chile contributed only 3 percent of the total export value.

Shipments of fish meal from Chile in the first 6 months of 1964 reached 77,600 tons with a value of \$8.2 million. A substantial amount of oil was awaiting shipment as of July 1964. If the supply of fish was adequate to maintain normal operations, exports in 1964 could reach 200,000 tons of meal and 30,000 tons of oil with a total value of \$25-30 million.

In 1965, the fish reduction industry of north Chile will have the plant capacity to support an export trade of some 400,000 tons of meal and 60,000 tons of oil, which at present prices would yield an exchange earning of approximately \$55 million.

The United States was Chile's best market for fish meal in 1963, but was replaced by West Germany during the first half of 1964. The Netherlands, Belgium, and Great Britain are the other principal markets. Venezuela was a strong purchaser in 1963. France and Italy increased their purchases substantially during the first 6 months of 1964. All fish meal is sold f.o.b. Chilean ports. The export price of fish meal averaged \$107 a ton in 1963; the price in October 1964 was around \$125. The trade expected prices to hold steady for the balance of 1964. Shipment is made in both jute and paper bags. Eventually some meal will be shipped in bulk.

The Netherlands continues to be Chile's principal market for fish oil (over 80 percent of the total exports of fish oil went to that market in 1963). The export price of fish oil averaged \$110 a ton in 1963, but in October 1964 ranged between \$150 to \$175 a ton. All shipments are made in bulk. (United States Embassy Santiago, October 29, 1964.)



Ghana

FOREIGN-BUILT TRAWLERS RECEIVED:

Delivery of the first of 7 large stern trawlers ordered from Norway by Ghana was formally accepted recently by the Board chairman of the government-controlled Ghana Fishing Corporation. Delivery ceremony for the 231-foot trawler Shama was at a West Norway shipyard.

The vessel has a deep-freeze capacity of 24 tons of fish a day, and 35,000 cubic feet of refrigerated storage space. It is Diesel-powered by engines generating 1,960 b. hp., coupled to reversible propellers; is capable of 14.9 knots; and can carry fuel for 60 days. Four of the other trawlers on order at Norwegian shipyards have already been launched, with 2 more vessels to be built.

Meanwhile, a group of 17 Ghanaians has begun intensive training in Oslo to qualify as engineers on the trawlers. The 11-month course, which started the middle of October 1964, includes elementary engineering and apprentice service at Norwegian shipyards. It is a part of a program, as yet to be formally worked out and approved, under which the Norwegian Agency for International Development (NORAD) will assist in training Ghanaian engineers and deck officers for the trawler fleet.

According to present plans for the projected cooperation between Ghana and Norway, NORAD will supply four instructors and special equipment for a maritime school to be established at the port of Tema in Ghana. Government authorities will provide the site, buildings, and some of the equipment, besides carrying part of the operating cost. The school will be jointly run for three years, and then transferred to local authorities in Tema. (News of Norway, November 12, 1964.)



Six stern trawlers are also being built at a shipyard in Wales, Great Britain, for the Ghana Fishing Corporation. These will be fitted with six-cylinder Diesel engines rated at over 2,000 b. hp.

Another new fishing trawler, the Sushion, was delivered to the state-owned Ghana Fishing Corporation in October 1964. The 176-foot trawler (644 gross tons) was built by a Soviet shipyard at Kiev and has a maximum fish-holding capacity of 140 metric tons.

Ghana is in the process of building up a large modern trawler fleet. The state-owned Fishing Corporation now has 8 trawlers, and 12 additional trawlers for the corporation are on order by the government. Ghana also has received the second of a group of 236-foot stern trawlers of 1,850 gross tons ordered from Japan. The order to the Japanese shipyard includes two fish carriers of 1,200 dead weight tons each. Ghana's vessel order to the Japanese shipyard is reported valued at about US\$16 million, the largest ever received from an African nation. World

Fishing, October 1964, and other published and unpublished sources.)

Note: See Commercial Fisheries Review, December 1964 p. 94, October 1964 p. 57 March 1964 p. 54.



Iceland

EXPORTS OF FISHERY PRODUCTS, JANUARY-AUGUST 1964:

During January-August 1964, there was an increase in exports of salted fish (uncured), frozen fish fillets, cod-liver oil, fish meal, and herring meal as compared with the same

Product	Jan.-Aug. 1964			Jan.-Aug. 1963		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
		Metric Tons	1,000 Kr.		Metric Tons	1,000 Kr.
Salted fish, dried	728	18,425	427	1,423	28,594	663
Salted fish, uncured	22,662	350,945	8,142	17,492	220,506	5,116
Salted fish fillets	1,001	14,424	335	921	11,498	267
Wings, salted	1,173	14,765	343	1,504	18,484	426
Stockfish	5,821	158,972	3,686	3,802	102,619	2,381
Herring on ice	19	140	3	7,224	23,417	543
Other fish on ice	20,547	118,811	2,756	19,762	101,862	2,363
Herring, frozen	14,415	85,873	1,992	25,733	142,139	3,298
Other frozen fish, whole	2,248	21,503	499	2,151	22,554	523
Frozen fish fillets	39,163	782,461	18,154	37,903	696,227	16,132
Shrimp and lobster, frozen	842	77,381	1,795	377	37,518	870
Roes, frozen	1,251	20,633	479	736	12,027	279
Canned fish	180	9,764	227	121	7,193	167
Cod-liver oil	7,748	70,097	1,626	6,006	42,280	961
Lumpfish roes, salted	417	10,913	244	313	5,140	119
Other roes for food, salted	2,635	39,370	913	3,176	44,919	1,042
Roes for bait, salted	2,421	20,131	467	1,745	12,571	292
Herring, salted	17,815	185,130	4,295	24,450	245,063	5,685
Herring oil	21,030	164,005	3,805	22,263	94,694	2,197
Ocean perch oil	28	188	4	116	515	12
Whale oil	2,812	23,944	556	2,887	19,157	444
Fish meal	24,403	151,717	3,520	8,465	48,232	1,119
Herring meal	53,636	314,661	7,300	42,190	253,272	5,876
Ocean perch meal	976	5,703	132	2,163	10,097	234
Wastes of fish, frozen	3,875	11,888	276	2,722	7,794	181
Liver meal	407	2,690	62	371	2,563	59
Lobster and shrimp meal	129	475	11	-	-	-
Whale meal	1,211	6,694	155	100	358	13
Whole meat, frozen	1,609	14,395	334	1,961	13,518	314

Note: Values converted at rate of 1 krona equals 2.32 U.S. cents.

period in 1963, according to the Icelandic periodical Hagtidindi, September 1964. Exports of herring on ice, frozen herring, salted herring, herring oil, and ocean perch meal showed a considerable decrease in the first 8 months of 1964.



India

FISHERIES TRENDS AND EXPORTS, FISCAL YEAR 1963/64 AND JANUARY-MAY 1964:

India's fishery landings in fiscal year 1963/64 (April-March) totaled one million metric tons or about the same as in the past three years. The outlook in the Indian fisheries seems to be a potential for greater exports which in recent years have increased in value.

The all-India Seminar met in Ernakulam (Kerala) in September 1964 and developed a plan for improving the export of

India (Contd.):

Indian fishery products from now until the end of the Fourth Five Year Plan in 1970/71. It was forecast that during that period the value of exports might be increased from the 1963 level of almost \$12.0 million to \$42.0 million.

In fiscal year 1963/64 India exported 18,398 tons of fishery products valued at almost US\$12.0 million compared with 10,859 tons valued at about \$8.5 million the previous fiscal year. The United States took about 42 percent of India's fishery products exports in 1963/64 valued at about \$5 million. Fishery products exports from that country to the United States were almost exclusively confined to frozen and canned shrimp and frozen spiny lobster tails.

Of the 16.2 million pounds of frozen and dried shrimp valued at \$6.6 million exported by India in fiscal year 1963/64, the United States took 8.2 million pounds (value \$3.9 million); total canned shrimp exports during that period were 2.4 million pounds valued at \$1.4 million, of which nearly 2 million pounds (value \$1 million) were shipped to the United States.

From 1952 to 1961, the United States aided fisheries development in the State of Kerala by contributing about \$1 million. Most of those funds went to help that State's fishing industry by building 2 ice plants, providing 4 refrigerated trucks, and assisting in a technical and fishery training program. In 1963, a Cooley loan (funds derived from sales of surplus United States agricultural commodities) was made to an Indian fishing company in Cochin which at that time became affiliated with a United States firm. Reports are that funds from that loan had not yet been used as of November 1964.

A survey of the shrimp, tuna, sardine, and mackerel resources of that area in India was made in 1963 by a United States tuna packing firm and sponsored by the U. S. Agency for International Development (AID). The United States firm's team of experts conducting the survey indicated that 6 or 7 fishery facilities would be required to exploit the available fishery resources. The project as proposed by the United States firm will produce fish meal and oil, as well as other fishery products, in a location in the Vizakapatnam and Cochin areas.

United States aid to India in supplying inboard engines, fishing gear, machinery and equipment for ice plants, cold-storage equipment, and pilot fish meal plants has made significant contributions to the development of marine fisheries in Maharashtra and Gujarat. The AID program also supplied a nylon twine and net-making factory near Bombay which started operating during the year. (United States Consulate, Madras, November 13, 1964.)

India's exports of marine exports during January-May 1964 amounted to 7,349 metric tons valued at 25.3 million rupees (US\$5.3 million), an increase of 17 percent in quantity and 5 percent in value from the same period in 1963. Besides dried fish, principal export items were: frozen shrimp, 5.2 million pounds valued at \$2.4 million; dried shrimp, 2.9 million pounds (\$0.9 million); frog legs, 265,000 pounds (\$139,000). Frozen shrimp exports were up 34 percent in quantity and 21 percent in value from the same 5-month period in 1963. (*Indian Seafoods*, Vol. II, No. 1, June 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 53; January 1964 p. 52.



Ireland

FISHING LIMITS EXTENDED TO 12 MILES:

Irish fishing limits were extended to 12 miles by the Maritime Jurisdiction (Amendment) Bill passed by the Irish Dail (Parliament) on November 5, 1964. The bill made it possible for the Government of Ireland to ratify and implement the "6-plus-6" fisheries convention approved by 13 nations in March 1964 at the European Fisheries Conference in London.

The Irish Minister of External Affairs announced that Ireland planned to designate Belgium, France, Germany, the Netherlands, Spain, and the United Kingdom as countries whose fishermen would have a right to fish in the 3- to 6-mile Irish coastal zone until December 1966. In applying the 3- to 6-mile limits to those fishermen, the base line will be the low-water mark until December 1965. After that time, straight base lines will be used.

The main effect of the new Irish fishing limits will be to exclude Eastern European and Scandinavian fishermen from Irish coastal waters. On the same day that the Maritime Jurisdiction (Amendment) Bill was considered and passed, the Irish Minister for Defense in reply to a parliamentary question noted that while the Irish Navy has 3 armed ships (corvettes), as a result of a shortage of key personnel only 1 of them can be operated at a time. The Minister of Defense said no decision had been made to purchase additional armed vessels for fishery protection. (United States Embassy, Dublin, November 13, 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 40.

FISHERIES REPORT RELEASED ON SURVEY MADE BY U. S. STUDY GROUP:

A report on the potential of the sea fisheries of Ireland, prepared by a team of United States fisheries specialists, was recently made public by the Government of Ireland, Dublin, announced the U. S. Department of the Interior on October 31, 1964.

The report was prepared this past summer by the four-man team from Interior's Bureau of Commercial Fisheries, and is the result of a cooperative study made at the request of the Government of Ireland.

The report includes recommendations that: (1) a stable Irish fishery policy is needed to encourage private investment; (2) the supply of fish and shellfish should be increased and stabilized; (3) the processing segment of Irish fisheries should be developed (the small population of Ireland limits the domestic market,

Ireland (Contd.):

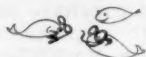
so major expansion would come from export of processed fishery products); and (4) Ireland's marketing structure should be streamlined to handle increased production.

At a news conference in Dublin, Ireland's Parliamentary Secretary to the Minister of Lands thanked the United States for its cooperation and said he "looks forward to useful cooperation in the future with American authorities in relation to fisheries problems of mutual interest."

The United States fisheries specialists made the study in cooperation with the Irish Sea Fisheries Board and the Fisheries Bureau of Ireland's Department of Lands. The survey resulted from a meeting in October 1963 between Irish Prime Minister Lemass and the late President Kennedy.

The United States study group was headed by John B. Glude, a marine biologist. Other members of the team were Joseph W. Slavin, a technology specialist, Robert Lavell, an economist, and Keith A. Smith, a specialist in exploratory fishing.

Note: See Commercial Fisheries Review, Sept. 1964 p. 69.



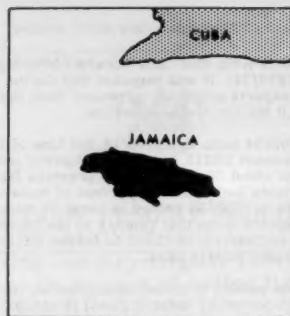
Jamaica

FISHERY INDUSTRY EXPANSION PLANNED:

A £3.5 million (US\$9.8 million) plan to develop Jamaica's fishing industry is being considered by the Jamaica Government, announced the Minister of Development and Welfare. The Minister states that the plan would provide employment for about 1,000 persons, contain provisions for exporting surplus fresh fish and shrimp, and include fish-canning operations.

The local press in Kingston also reported that the Minister referred to the possibility of a tuna-canning plant. There have been rumors over the past several years that the Government has been interested in attracting a tuna-canning plant to Jamaica. As of the end of October 1964, no final decisions had been made by the Government on the proposed fishery plan.

The Minister also announced a \$2.5 million Fisheries Development Project to be financed



by the United Nations Special Fund and Caribbean governments. (United States Embassy, Kingston, October 29, 1964.)



Japan

FROZEN TUNA EXPORT MARKET TRENDS:

The price of Japanese whole frozen albacore tuna exported to the United States from Japan proper early in November 1964 declined to US\$355 a short ton c.i.f. or \$5 a ton less than gilled-and-gutted frozen yellowfin. The decline in the albacore price, even below that for yellowfin, was attributed to the large quantity of albacore landed by Japan's tuna longliners operating in the Atlantic Ocean. Almost all that albacore was transshipped to United States canneries at Puerto Rico. In addition, there have been substantial quantities of albacore transshipped to the United States from the Indian Ocean.

In mid-November about 500 short tons of frozen albacore were to be shipped to Puerto Rico from the newly designated transshipment port of Durban, South Africa. In late November, 1,500 tons of frozen albacore were to be shipped to Puerto Rico from Port Louis, Mauritius Island, which was also recently designated as a transshipment port. The Port Louis shipment was to be transported on a Norwegian vessel.

Catch of yellowfin tuna continued poor in the Atlantic Ocean as of early November. As a result, exports of Japanese-caught yellowfin tuna (gilled and gutted) to Italy were bringing the unusually high price of \$420-425 a metric ton c. & f. (Suisan Tsushin, November 5; Suisancho Nippo, November 7, 1964.)

Japan (Contd.):

EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO U. S., JANUARY-SEPTEMBER 1963-64:

Japan's export validations of frozen tuna and frozen tuna loins to the United States in September 1964 totaled 13,274 short tons. Of that total, 48.8 percent were for albacore tuna, 45.8 percent for yellowfin, 0.2 percent big-eyed, 0.8 percent skipjack, and 4.4 percent tuna loins.

TUNA PURSE-SEINE FLEET ARRIVES IN AFRICA:

The Japanese fishing company's five-boat tuna purse-seining fleet, led by the refrigerated mothership Chichibu Maru (1,600 gross tons), arrived at Freetown, Sierra Leone, on November 5, 1964. The fleet, which was to be joined by seven pole-and-line tuna vessels, was scheduled to start fishing immediately.

Japan's Export Validations for Frozen Tuna and Tuna Loins to U.S., January-September 1964 with Comparisons

Species	Sept. 1964			Jan.-Sept. 1964			Jan.-Sept. 1963			Total 1963
	Direct	Trans- shipped	Total	Direct	Trans- shipped	Total	Direct	Trans- shipped	Total	
	(Short Tons)									
Albacore, round	4,023	2,455	6,478	21,059	26,148	47,207	7,395	20,430	27,825	36,737
Yellowfin:										
Round	-	147	147	-	1,088	1,088	-	501	501	-
Gilled & gutted:										
20/100 lbs.	3,846	911	4,757	22,566	3,259	25,825	14,344	3,851	18,195	-
100 lbs. up	462	-	462	2,236	-	2,836	880	-	880	-
Drsd. with tail	50	664	714	75	3,971	4,046	-	3,684	3,684	-
Filletlets	-	-	-	33	12	45	262	104	366	-
Total	4,358	1,722	6,080	24,910	8,330	33,840	15,486	8,140	23,626	33,370
Big-eyed:										
Gilled & gutted	-	-	-	30	30	60	20	4	24	-
Drsd. with tail	-	27	27	-	197	197	-	240	240	-
Filletlets	-	-	-	37	3	40	6	42	48	-
Total	-	27	27	67	230	297	26	286	312	316
Bluefin fillets	-	-	-	-	1	1	-	374	374	374
Skipjack, round	-	103	103	8	2,969	2,977	70	2,312	2,382	3,762
Loins:										
Albacore	239	-	239	2,436	-	2,436	1,586	-	1,586	-
Yellowfin	347	-	347	2,871	-	2,871	2,048	-	2,048	-
Bluefin	-	-	-	-	-	-	157	-	157	-
Total	586	-	586	5,307	-	5,307	3,791	-	3,791	6,183
Grand Total	8,967	4,307	13,274	51,351	37,678	89,629	26,768	31,542	58,310	80,742

Source: Japan Frozen Food Exporters Association.

Source: Japan Frozen Food Exporters Association.

During January-September 1964, Japan's export approvals amounted to 89,629 short tons, an increase of 31,319 short tons or 54 percent more than the 58,310 short tons exported during the same period in 1963. On a species basis albacore exports were up 70 percent, yellowfin 43 percent, skipjack 25 percent, and tuna loins 40 percent. Exports of big-eyed tuna were down 5 percent.

Frozen tuna approved for export during January-September 1964 exceeds the total amount exported during all of 1963 by 8,887 short tons. (Fisheries Attache, United States Embassy, Tokyo, October 15, 1964.)

The catches are to be sold to a large United States canning firm. (Shin Suisan Shimbun Sokuho, November 7, 1964.)

PURSE-SEINING GEAR IMPROVEMENTS ADOPTED:

Purse-seine fishing off the Sanriku district (northeastern Japan) is drawing attention in Japan as one of the bright spots in the Japanese fishing industry as a result of the introduction of the power block and other improvements in fishing gear and techniques.

Japan (Contd.):

Purse-seining is conducted by one-boat seiners of up to 250 gross tons, which fish mainly for skipjack tuna; and by two-boat seiners, which fish primarily for bluefin tuna. Two-boat seining involves a total of 5-7 fishing vessels. They include two seiners of less than 80 gross tons each, skiffs, and transport vessels.

In 1962 one of Japan's large fishing companies introduced the power block, which was installed on the *Keiyo Maru* (240 gross tons). Two years of experiments with the power block, using a modified version of the United States purse-seine net, have sufficiently demonstrated the value of that mechanical device in reducing manpower requirements from about 27 to 18. An increasing number of two-boat purse-seine operators are reported to be contemplating converting to the one-boat type operation.

More recently, a mechanical net hauler was developed in Japan. Called the "side hauler," this gear, developed and patented by a Japanese fishing company of Ishinomaki, consists of a number of rubber "balls" mounted at two-meter intervals on a hydraulically-operated rotating shaft located on the side of the vessel. During net hauling, the "balls" on the rotating shaft cause the net to fold between them, thus facilitating hauling. One Japanese fishing company has adopted the side hauler for use on the two purse-seiners (140 gross tons each) assigned to the *Chichibu Maru No. 2* (1,639 gross tons) mothership fleet, which was scheduled to commence skipjack fishing in the Atlantic Ocean off West Africa in mid-November 1964.

Advantages of the side hauler are: (1) manpower requirement for net hauling is reduced by one-third (in a two-boat operation from 70-80 men down to about 50); (2) net hauling time is reduced one-half; (3) net setting can be done ten times faster, and completely without human labor, because of its reversible feature; (4) damage to net during setting and hauling is greatly reduced; and (5) operation and repair are simple.

Other new equipment being adopted by Japanese purse-seiners includes the side thruster and the bow thruster. The thrusters prevent vessel drift during fishing operations and perform the task heretofore undertaken by skiffs.

The discovery of fish schools is the key to successful purse-seine fishing. New scouting methods, such as the use of television cameras on small unmanned aircraft and underwater radar are being studied. Also under study is the problem of engine vibration on large steel vessels, which has been found to cause dispersion of fish schools. Padding of the engine bed is being experimented as a means of reducing vibration. (*Hokkai Suisan*, October 19; *Suisan Keizai Shimbun*, October 19; *Suisan Taushin*, October 16, 1964.)

CANNED SALMON PRODUCTION AND MARKET TRENDS:

The Japanese fishing companies which purchased about 7,200 metric tons of Alaskan salmon (Prince William Sound fish) in August 1964 were expected to finish canning those fish (for export only) by the end of November. The companies had originally hoped to can 300,000 cases of pink salmon, but about one-third of the Alaskan pinks (when scheduled for canning) were not expected to meet export standards, so those fish were to be salted for sale on the Japanese domestic market. Of the revised pack target of 200,000 cases, about 40,000-50,000 cases were expected to be packed as fancy and the remainder as standard.

In addition, about 1,000 tons of chum salmon of Alaskan origin were scheduled for sale on the Japanese market. To avoid market disruption, the Fisheries Agency had ruled that only one-half or 500 tons should be placed on the market in 1964, with the remainder to be released in 1965. Frozen round chum of Alaskan origin sold through one brokerage firm brought 300 yen a kilogram (38 U.S. cents a lb.) for female fish and an average of 225 yen a kilogram (28 U.S. cents a lb.) for mixed (male and female) fish.

The Japan Canned Salmon Sales Company announced in late October the following export prices for their products:

Japanese Canned Salmon Export Prices, 1963-1964				
Type, Can and Case Size	Price/Case			
	1964		1963	
	Shilling	US\$	Shilling	US\$
Red, standard 1/				
1/2-lb. 48's	157	21.98	147/6	20.65
1/4-lb. 96's	196	27.44	192/6	26.95
Silver, standard 2/				
1/2-lb. 48's	115	16.10	103	14.42
1/4-lb. 96's	137	19.18	-	-
Pink, fancy 3/				
1/2-lb. 48's	-	11.50	-	11.50
1/4-lb. 96's	-	13.50	-	13.50
Pink, standard 4/				
1/2-lb. 48's	-	11.00	-	11.00
1/4-lb. 96's	-	13.00	-	13.00

1/C.I.F.; to be shipped by February 28, 1965. However, exports to Australia to be shipped by December 31, 1964.

2/C.I.F.; to be shipped by December 31, 1964.

3/F.O.B.; to be shipped by December 31, 1964.

4/F.O.B.; to be shipped by February 28, 1965.

Quantity of canned salmon to be released as follows:

red salmon, standard: about 63,000 cases of 1/2-lb. 48's and 5,000 cases of 1/4-lb. 96's. The 1/4-lb. style made up of fish of Alaskan origin.

silver salmon, standard: slightly less than 5,000 cases.

pink salmon: of 450,000 cases consigned to the Sales Company, 360,000 cases sold, leaving on hand 90,000 cases. About 200,000 cases of pink of Alaskan origin expected to be canned by November's end, thereby, leaving on hand 290,000 cases.

The salmon of Alaskan origin (pink) was expected to be canned in the following styles and quantity:

1/2-lb. fancy	27,000 cases
1/2-lb. standard	110,000 "
1/4-lb. fancy	17,000 "
1/4-lb. standard	40,000 "

(*Suisan Taushin*, October 30, 31, & November 2 & 9; *Hokkai Suisan*, November 9, 1964.)

CANNED SHRIMP EXPORTS, JANUARY-SEPTEMBER 1964:

Japan's exports of canned shrimp in January-September 1964 amounted to 372,224 cases (converted to 24 1-lb. cans). During that period Great Britain received the largest share, or 46 percent of the total exports which were 33 percent more than was received during the entire year 1963. The United States took about one-third Japan's total canned shrimp exports in the first 9 months of 1964 as compared with 59 percent during the entire year 1963.

Japan's export target for fiscal 1964 was originally set at 600,000 cases, of which 440,000 cases were to go to the United States and Canada. The export target was later reduced to 500,000 cases, with a larger quantity earmarked

Japan (Contd.):

Table 1 - Japan's Exports of Canned Shrimp by Country of Destination, January-September 1964

No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases).							
24/1-lb.	small	-	100	-	-	50	150
24/1/2-lb.	"	35,131	70,654	3,636	9,185	4,511	123,117
24/1/4-lb.	"	2,130	15,943	-	-	-	18,307
48/1/4-lb.	"	250	5	-	500	120	875
24/1/2-lb.	tiny	36,662	33,410	1,000	3,920	8,531	83,523
24/1/4-lb.	"	6,274	22,626	-	400	799	30,099
48/1/4-lb.	"	-	14,230	-	-	4	14,234
24/1/2-lb.	broken	44,866	9,300	44,692	-	2,491	101,349
24/1/4-lb.	"	2,262	40,930	-	-	241	43,433
48/1/4-lb.	"	949	2,050	-	-	25	3,024
Total std. cases 1/		123,191	169,598	49,328	13,805	16,302	372,224
Export target - 1964 2/		165,000	230,000	65,000	20,000	20,000	500,000

1/Converted to 24 1/2-lb. cans per case.

2/Total export target reduced to 500,000 cases from original estimate of 600,000 cases.

Source: Japan Canned Crab Sales Company, since May 1, 1963, has acted as sole sales agent for canned shrimp.

Table 2 - Japan's Exports of Canned Shrimp by Country of Destination, January-December 1963

No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases).							
24/1/2-lb.	-	134,859	51,678	18,364	11,018	15,587	231,506
24/1/2-lb.	small	86,399	59,110	26,750	22,055	4,620	192,934
48/1/4-lb.	"	1,933	9,000	-	4,535	1,182	16,650
24/1/2-lb.	tiny	52,825	1,350	6,050	3,650	3,795	67,670
48/1/4-lb.	"	500	200	-	235	3,682	4,617
24/1/2-lb.	broken	111,511	50	26,080	-	2,264	139,905
48/1/4-lb.	"	7,130	6,000	-	-	665	13,795
Total std. cases 1/		395,157	127,388	71,244	41,493	31,795	667,077

1/Converted to 24 1/2-lb. cans per case.

Source: Ministry of Finance and Japan Canned Crab Sales Company.

Table 3 - Japan's Exports of Canned Shrimp by Country of Destination, January-December 1960-63

Calendar Year	No. Cans per Case	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Std. Cases).							
1963	24/1/2-lb.	395,157	127,388	71,244	41,493	31,795	667,077
1962	24/1/2-lb.	199,944	104,057	84,385	8,345	21,205	417,936
1961	24/1/2-lb.	31,314	11,876	19,051	2,082	10,980	75,303
1960	24/1/2-lb.	2,366	3,478	453	551	7,576	14,424

Source: Ministry of Finance.

ed for Great Britain but with fewer shipments to the United States. (Fisheries Attache, United States Embassy, Tokyo, November 5, 1964.)

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FISH CANNERS DISCUSS PRODUCTION COSTS WITH FISHERIES AGENCY REPRESENTATIVES:

The Japanese Fisheries Agency has plans to extend its authority to the manufacture and sale of fishery products. It will also cooperate in the promotion of Japanese fishery exports. That was disclosed at a Tokyo conference attended by officials of the Fisheries Agency and representatives of the Japanese canned fish industry. The purpose of the con-

ference was concerned with promoting exports of Japanese canned fishery products.



Fig. 1 - Cutting table in a tuna cannery in Hiroshima, Japan.

Japanese tuna cannery at the conference asked the Fisheries Agency to set up some control over the supply of tuna for canning. The tuna cannery said Japanese exports of frozen tuna were increasing and causing scarcities and high prices on tuna used for canning.



Fig. 2 - Interior of a tuna cannery in Hiroshima. In right foreground is a vacuum seamer.

Japanese land-based salmon cannery requested an extension of the fishing period in Area B (Japanese-U.S.S.R. Fisheries Treaty waters south of 45° N. latitude) in order to ease the high costs of fish due to light landings.

Canned fish industry representatives at the conference also expressed an interest in lower prices for metal cans and lower interest rates for financing. (Nihon Kogyo, October 19, 1964.)

* * * * *

Japan (Contd.):

POSITION DEVELOPED FOR INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION MEETING:

The Japanese Fisheries Agency, on November 12, 1964, according to the Japanese press, held a meeting with Japanese industry advisors to develop the position Japan should take at the Annual Meeting of the International North Pacific Fisheries Commission (Canada, Japan, and United States) which convened at Tokyo from November 16, 1964. The position adopted at that meeting with respect to salmon and halibut was believed to be essentially as follows:

1. With regard to the regulation of salmon fishing in the intermingling area west of the provisional abstention line, Japan will maintain her traditional position that Japanese high-seas fishing, which is not subject to restrictions under the present Treaty, shows no evidence of adversely affecting reproduction of the Bristol Bay red salmon. However, while paying careful attention to resource conservation, Japan should stress the establishment of rational joint conservation measures to be carried out after the conclusion of a new treaty without regard to the existing provisional abstention line. Concerning other salmon species and king crab, Japan will bear in mind her relations with the Soviet Union and continue to maintain her earlier attitude.
2. As for Bering Sea halibut conservation measures for 1965, since halibut catches in 1964 were extremely poor, with indications of declining abundance, Japan will propose closing Triangle Area 3B to rehabilitate the stocks.
3. Japan will strongly press for removal of restrictions on halibut fishing in Area 1 and Area 3B South.

The Japanese position adopted at the November 12 meeting with respect to trawl operations in the Gulf of Alaska and in the waters south of the Alaska Peninsula is believed to be as follows:

1. Japan will avoid detailed discussions on the effect trawl operations have on halibut stocks in Convention waters, since bottomfish fishing is not restricted by the Treaty. Moreover, the species of fish taken in the Gulf of Alaska and in waters south of the Alaska Peninsula are bottomfish other than halibut.
2. In view of the relatively large number of foreign fishing vessels other than those of Japan, the United States, and Canada operating in those waters, as well as the very low percentage of halibut taken incidentally by the Japanese trawlers, Japan plans to increase her trawl fleet in the Gulf, although not on a substantial scale. Japan should notify the member countries of her intentions of conducting year-round fishing, including mothership-type operations, in those waters. To avoid catching halibut, Japan should exert efforts to develop improved stern-trawling techniques.
3. Japan will oppose closure of areas to trawling since Japanese trawl operations have not adversely affected the halibut stocks. Reasons for opposing such an action are: (1) trawling for bottomfish other than halibut is not restricted by the Treaty; and (2) incidental halibut catches are returned to the ocean, so there is no need to establish closed areas to assure protection of that species.
4. Concerning Article III-1 of the Convention, which provides for joint conservation measures for those species of fish listed in the Annex, Japan will recommend that further investigations be made since data presently

available shed very little information. (Suisan Tsushin, November 14, 1964.)

INDUSTRY MEETING SCHEDULED TO DEVELOP POSITION FOR NORTHWEST PACIFIC FISHERIES COMMISSION MEETING:

The Japanese Fisheries Agency scheduled a series of meetings, beginning in early December 1964, to study the position that Japan should take at the Ninth Annual Meeting of the Northwest Pacific Fisheries Commission (Japan and U.S.S.R.) scheduled to begin in Tokyo, March 1, 1965).

According to informed sources, Japan likely will request an increase in salmon catch quotas for both Areas A and B (1964 quota for each area was 55,000 metric tons), as well as an increase in the king crab production quota. Japan's share of the 1964 king crab production quota of 630,000 cases (48 No. 2 or 6.5 oz. cans) was 252,000 cases. The Japanese industry is said to feel that the request for an increase in salmon catch quota is not unreasonable inasmuch as 1965 is a dominant year for Asian pinks. Also, the condition of the salmon resources as a whole is almost certainly to be far better than it was in 1964.

However, based on the experience of the last few sessions, these same sources believe that the negotiations will be anything but smooth. Their belief is based on the following reasoning: (1) As yet there has not been a formal exchange of notes on increasing the catch in 1965 (peak year for pinks) as there was prior to the Seventh Session; (2) unexpected poor catch of salmon in 1964; (3) report broadcasted by Radio Moscow towards the end of the 1964 fishing season that the catch quota agreed on at the Eighth Annual Meeting was much too high; (4) increased interest shown by Soviet Union towards regulating the fishery in Area B; and (5) the effect of the Japan-United States king crab negotiation and the negotiations to revise the Tripartite Fisheries Treaty or the International North Pacific Fisheries Convention--Canada, Japan, United States. (Suisan Keizai Shimbun, November 14, 1964.)

BERING SEA BOTTOMFISH FISHERY:

The Japanese fishing companies operating bottomfish fleets in the Eastern Bering Sea have begun a study to determine fishing plans

Japan (Contd.):



Main deck of a Japanese factoryship in Bering Sea. In center a netload of fish is being unloaded from a lighter.

for 1965. Their fleets landed in 1964 a combined total of 411,130 metric tons of bottom-fish, surpassing 1963's landings by about 100,000 tons. However, from a management standpoint, the companies have not done too well due to a drop in fish prices and higher operational expenses. As a result, the firms hope to devise measures to stabilize their operations and are considering such measures as reducing the number of catcher vessels assigned to motherships and reducing the number of non-fishing motherships and replacing them with large stern trawlers. (Suisan Keizai Shimbun, October 30, 1964.)

TRAWLING OPERATIONS IN GULF OF ALASKA:

The six Japanese trawlers operating in the Gulf of Alaska waters as of October 13, 1964, caught a total of 17,000 metric tons of bottom-fish (rockfish 11,000 tons; shrimp 2,700 tons; sablefish 900 tons; flatfish 600 tons; others 1,800 tons). This was an increase of 8,000 metric tons over the 1963 landings, which totaled 9,000 metric tons.

The trawler Tenryu Maru (545 gross tons), operated jointly by two Japanese firms, was expected to terminate operations around October 20. The other 5 trawlers were scheduled to continue operations in the Gulf until the end of October. (Suisancho Nippo, October 16, 1964.)

DEVELOPMENT OF NEW FISHING GROUNDS PLANNED:

Japan's Fisheries Agency plans to start developing new fishing grounds at home and abroad starting fiscal year 1965 with the objective of increasing fish resources. The reason behind that plan is that the demand-supply relationships of fish are getting out of balance because fish production has been static during the past 2 or 3 years, while the demand centered on high- and medium-grade fish is continuing to increase. Another reason is that, if this situation continues, there is the fear that Japan, which is a fisheries nation, may become an importer of fishery products. Therefore, from the standpoint of developing large shallow-sea fishing grounds at 20 places along the coast of Japan, the Fisheries Agency plans first to conduct topographical and boring surveys at 6 of those places in fiscal year 1965, and to formulate a new fishing grounds development project. Moreover, in order to develop the undeveloped sea areas south of Africa, Australia, and South America, the Fisheries Agency plans to build a new type 2,600-ton vessel in 2 years starting in fiscal year 1965, and to send it first to sea areas around Australia.

The survey conducted by the Fisheries Agency reveals that the keynote of the demand-supply relationships of marine products has gotten out of balance during the past 2 or 3 years and that the prices of such products are also tending to rise. Fishery landings are showing a leveling-off trend. They amounted to 6,710,000 tons in 1961; 6,860,000 tons in 1962; and 6,690,000 tons in 1963. On the other hand, the focus of demand for marine products is moving from fish for popular use, such as horse-mackerel, mackerel, and mackerel-pike to high- and medium-grade fish such as bream, bass, lobster, and yellow tail. The demand level was up to 7,110,000 metric tons in 1962. Thus, demand-supply relationships are tending to be out of balance.

Moreover, under a mid-term economic plan, maximum production in 1968 is estimated at between 7,400,000 tons and 7,600,000 tons, while the demand level is estimated at 9,540,000 tons. The gap between the two figures is wide. Under the circumstances, Japan will either have to import large quantities of fishery products or locate new fishing grounds. (Translation from the Japanese periodical Nihon Kaizai, United States Embassy, Tokyo, November 5, 1964.)

FROZEN MACKEREL EXPORTS TO RUMANIA:

Several Japanese trading firms are actively engaged in exporting frozen mackerel to Rumania and other countries in eastern Europe. A Tokyo trading company reported signing a long-term contract to export monthly 750 metric tons of East China Sea mackerel to Rumania. Another trading company also signed a contract to export 720 metric tons to that country. Both transactions are said to have been concluded at export prices of around US\$286 a metric ton c.i.f. Rumania. (Minato Shimbun, October 17, 1964.)

FISHING UNION ADOPTS FIXED MINIMUM WAGE SYSTEM:

The Fishermen's Union (membership 2,529) of Muroto, Kochi Prefecture, Japan, has signed a wage contract with the Murotomisaki Boat-owners Association calling for the payment of a minimum of 22,500 yen (US\$62.50) a month

Japan (Contd.)

in fixed wages for members sailing on vessels under 200 gross tons and 23,500 yen (\$65.28) a month for those sailing on vessels over 200 gross tons. In addition, the contract calls for production incentives in the form of bonuses, calculated on the basis of vessel size, value of landing, and days out fishing. Bonuses are expected to total no less than 25,000 yen (\$69.44) a month, so the monthly income of the lowest level seaman is expected to total close to 50,000 yen (\$138.88), or about 15 percent higher than under the former catch-share system.

The new wage agreement also provides for 12 days of leave with pay, trip expenses for home visits, no work on Sundays, legal holidays and eight-hour work days while in port, and eight hours rest per day while at sea. (Suisancho Nippo, October 29, 1964.)

CONSTRUCTION BIDS FOR FORMOSAN TUNA VESSELS AWARDED IN JAPAN:

Awards for the construction in Japan of 16 Formosan tuna vessels were formally announced in early November 1964. The Japanese shipbuilding firm awarded one contract is to build three 1,300-ton vessels, another firm awarded a contract is to build eight 300-ton vessels, and still another firm five 300-ton vessels. (Suisancho Nippo, November 9, 1964.)

VESSEL CONSTRUCTION LOAN OBTAINED FROM GREAT BRITAIN:

A Japanese fishing firm has borrowed US\$3.0 million from a London bank to be partly applied for the payment of stern trawlers that company plans to build. Under the loan agreement, the loan will be payable in five years, including a two-year deferment period. Interest rate is 6 percent per annum. Reportedly, the interest rate for a similar loan secured in Japan is 9.6 percent per annum. (Nihon Suisan Shimbun, October 9, 1964.)

IMPORTATION OF 71,000 TONS OF FISH MEAL:

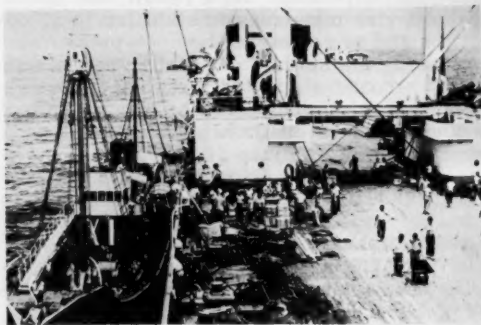
The Ministry of International Trade and Industry of Japan announced that it has authorized foreign funds for the importation of 71,000

metric tons of fish meal for the period November 1964-March 1965. Of the 71,000 tons, 50,000-60,000 tons had been contracted for delivery at US\$131-132 a metric ton c.i.f. The contracts were negotiated before the increase in price of Chilean and Peruvian fish meal. The current prevailing price of Chilean and Peruvian fish meal is estimated at US\$151-153 a metric ton c.i.f. Japan.

Japanese imports of foreign meal after April 1965 are expected to total 13,000-15,000 metric tons a month. (Suisan Tsushin, November 6, 1964.)

PRODUCTION TARGET OF 1964/65 ANTARCTIC WHALING EXPEDITION:

Three Japanese fishing companies will operate 7 factoryships in Antarctic waters during the 1964/65 international Antarctic whaling season. This is the same number of vessels as operated during the 1963/64 season. With the exception of the factoryship Nisshin-Maru No. 2, which was scheduled to sail from Japan on November 7, 1964, the other 6 vessels had departed for the whaling grounds at an earlier date.



Whale catcher boat alongside whaling factoryship to receive supplies and fuel.

The catch target for sperm whales is set at 1,870 head, a decrease of 1,030 head, or 35.5 percent below the target of 2,900 head set for the 1963/64 season. The cutback in catch for the current season is attributed to the large quantity of unsold stocks of sperm whale oil (11,400 metric tons) produced by the Antarctic and North Pacific whaling expeditions during the previous season.

Japan (Contd.):

Baleen Whale Production Target of Japan's 1964/65 Antarctic Whaling Expedition		
Product	Total	
	1964/65 Season	1963/64 Season
	..... (Metric Tons)	
Oil	85,494	95,376
Frozen meat	143,136	144,418
Salted meat	6,280	6,235
Meal, bone powder, etc	5,511	5,054
Total	240,421	251,083
Yield per head	57.79	54.60
Blue-whale units	4,160	4,600

The production target of Japan's 1964/65 Antarctic expedition for baleen whale oil, meat, meal and bone powder is shown in table.

(Fisheries Attache, United States Embassy, Tokyo, October 28, 1964.)

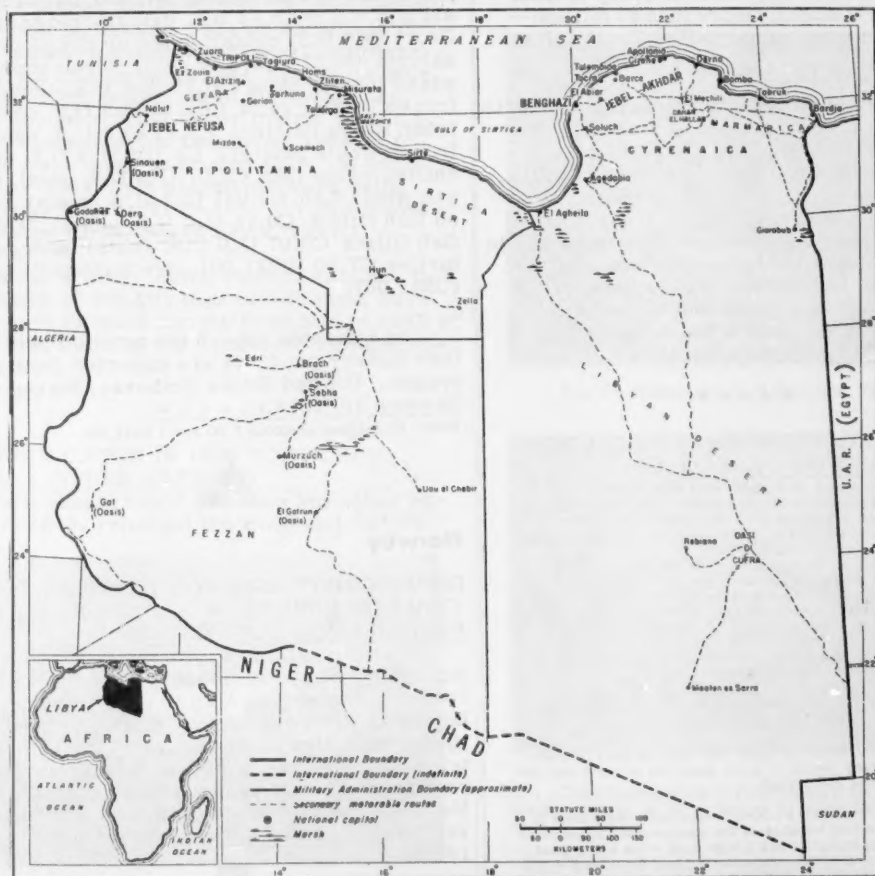
Note: See Commercial Fisheries Review, January 1964 p. 59.

日本

Libya

GREEK VESSELS LICENSED TO
OPERATE IN LIBYAN WATERS:

The Government of Libya allowed Greek trawlers and sponge vessels to operate in certain Libyan territorial waters in 1964 after paying the following license fees: trawler £L500 (US\$1,400); sponge fishing vessel £L250 (\$700); and simple fishing vessel £L100 (\$280).



Libya (Contd.):

Each Greek trawler obtaining a license to fish in Libyan waters was required to take three Libyan nationals on board for fisheries training. (Alieia, April 1964.)

Note: Libyan pound 1.00 equals US\$2.80.



New Zealand

FOREIGN TRADE IN FISHERY PRODUCTS, 1964:

New Zealand's total exports of fishery products for the fiscal year ended June 1964 were valued at US\$4.3 million. Those exports included 2.8 million pounds of spiny lobster tails valued at slightly more than \$3 million--the biggest money earner in New Zealand fishery exports.

Among other export items during the period were 5.5 million pounds of fresh and frozen fish valued at \$1.2 million, and 16,571 imperial gallons of fish oil valued at about \$166,000.

New Zealand's imports of fishery products consisted almost exclusively of canned fish. For the year ended June 1964, a total of 6.3 million pounds of canned fish valued at \$2.6 million was imported. (New Zealand Commercial Fishing, September 1964.)

DYE-LESS COLORING TREATMENT FOR DARK-MEAT FISH DEVELOPED:

A method of coloring dark-meat fish without the use of dyes has been developed at Massey University, New Zealand. The technique was developed for New Zealand "kahawai," but it might also be applied to mackerel and other dark-meat fish.

The New Zealand Health Department, which had previously disallowed the coloring of canned kahawai for the New Zealand market, is understood to be favorably disposed to the new method.

The new coloring technique involves injecting or soaking fish with some of the same ingredients as are used in the curing of meat. The effect of such treatment on dark-meat fish is to induce a pink tint into the fish after cooking instead of the usual unattractive brownish color.

As the use of the coloring agent has been adopted by meat processors for many years, it is not expected to raise any objections from health authorities.

There is reported to be a marked consumer resistance to kahawai as a table fish because of the unappetizing appearance when cooked, even though it has a high food value and a good flavor. The approval of the new coloring technique by the New Zealand Minister of Health will remove one marketing obstacle.

It is thought, however, that to overcome traditional objections to kahawai it may be necessary to change its name to give it a different image. "Native salmon" is one of the new names suggested. (New Zealand Commercial Fishing, September 1964.)



Nicaragua

NEW EXPORT TAX ON FISHERY PRODUCTS:

Nicaraguan Decree No. 973, establishing an export tax on fishery products, was published in La Gaceta No. 197, August 28, 1964. The export tax replaces the profits tax levied under Article 28 in the Special Law on Exploitation of Fish of 1961.

Under the new law, the export tax rates per pound are as follows: fresh unprocessed shrimp C0.36 (5.14 U.S. cents); frozen shrimp C0.21 (3.0 U.S. cents); dried or dehydrated shrimp C0.07 (1.0 U.S. cent); fresh unprocessed lobster tails C0.35 (5.0 U.S. cents); frozen lobster tails C0.175 (2.5 U.S. cents); fresh whole lobsters C0.21 (3.0 U.S. cents); frozen whole lobsters C0.105 (1.5 U.S. cents); chilled whole fish C0.07 (1.0 U.S. cent); frozen whole fish C0.021 (0.3 U.S. cents); chilled fish fillets C0.14 (2.0 U.S. cents); frozen fish fillets C0.07 (1.0 U.S. cents); processed turtles C7.00 (US\$1.00); live turtles C21.00 (US\$3.00).

The indicated export tax must be paid before fishery products are exported from Nicaragua. (United States Embassy, Managua, October 29, 1964.)

Note: Nicaraguan cordobas 7.00 equal US\$1.00.



Norway

GOVERNMENT ASKS FOR INDUSTRY VIEWS ON EUROPEAN "6-PLUS-6" FISHING LIMIT CONVENTION:

All organizations within the Norwegian fishing industry have received a questionnaire from the Norwegian Ministry of Fisheries asking for their views on the "6-plus-6" fishing limit convention signed by 13 of the 16 countries attending the European Fisheries Convention in London in January 1964. Norway, Iceland, and Switzerland did not sign the Convention. (News of Norway, November 19, 1964.)



Peru

FISH MEAL INDUSTRY TRENDS, SEPTEMBER 1964:

Peruvian fish meal production in September 1964 totaled 49,000 metric tons, about the same as in September 1963. Peruvian fish meal production in January-September 1964 totaled 1,059,000 tons, up 28 percent from Peruvian production in January-September 1963.

Peruvian exports of fish meal in September 1964 were 82,000 tons bringing shipments for January-September 1964 to 1,098,000 tons, almost 25 percent ahead of the same period in 1963.

Spot prices for Peruvian fish meal eased somewhat in October 1964 as anchoveta fishing showed an expected seasonal improvement. In late October 1964, prices for November 1964 deliveries of Peruvian meal were quoted at US\$135 per metric ton f.o.b. Peru; quotations for December 1964 shipments were down to around \$126. In early October 1964, spot shipments were being quoted as high as \$145-150. (United States Embassy, Lima, November 4, 1964.)

Editor's Note: Some reports indicate that in excess of 500,000 tons of fish meal have been sold forward for the first half of 1965 at \$100-108 a ton by the Consorcio Pesquero del Peru S. A.

FISHERY CATCH IN 1963 TOPS THAT OF ALL OTHER NATIONS:

Peru caught more fish than any other nation in 1963, reported the Food and Agricul-



Fig. 1 - Peruvian fishing vessel with hold and decks loaded with anchovetas getting ready to unload.

ture Organization (FAO), October 30, 1964. Fishery landings by that country totaled 6,901,300 metric tons in 1963, as compared with Japan's catch of 6,697,800 tons. Japan had been the world's leading fishing nation since FAO began collecting world fishery catch statistics in 1947.



Fig. 2 - Portion of Mancora tuna fleet.



Fig. 3 - Unloading tuna at Chimbote, Peru.



Fig. 4 - Tuna caught by small Peruvian boats are landed on the beach, awaiting to be picked up by truck for trip to freezer.

The bulk of the Peruvian 1963 catch was made up of anchoveta, a small fish found in great schools a few miles off the Peruvian

Peru (Contd.):

coast. The anchoveta is used for reduction in fish meal and oil for animal feeding, and is the principal factor in Peru's position as the world's leading exporter of fish meal. Peru's fishery catch now is close to 150 times larger than the 47,700-ton catch in 1948. (Food and Agriculture Organization, Rome, October 30, 1964.)



Philippine Republic

PURSE-SEINE FISHERY
BEING DEVELOPED:

Since early 1963, a Norwegian master fisherman has been showing Philippine fishermen how to fish with purse-seine nets. The Nor-



Fig. 1 - Philippine purse-seine vessel scouting for mackerel in the Sulu Sea off Palawan Island in the western Philippines. The vessel is equipped with an echo-sounder.



Fig. 2 - Philippine purse-seine vessel ready to begin night-light fishing in Sulu Sea. Note metal lamps set over the side to attract fish. Often it is midnight before enough fish are attracted to justify setting the purse-seine net.

wegian expert was sent by the Food and Agriculture Organization to help the Philippine Fisheries Commission develop a purse-seine fishery. Striking success has been reported in the project. The Philippine private company which did pioneering work in the new fishery now has five purse-seine vessels in almost year-round operation. It also operates 11 carrier vessels which carry the purse-seine catch to metropolitan markets.



Fig. 3 - Philippine fishermen brailing mackerel from purse-seine net. As the fish are hauled in, ice is thrown over from the carrier vessel alongside. The fish and ice are then shoveled into tubs which are hoisted to the carrier vessel to be transported to market.

Other Philippine private companies are entering the purse-seine fishery. By the end of 1964, a total of 30 Philippine purse-seine vessels were expected to be in operation. The new purse-seine fishery is one phase of the Philippine project to achieve self-sufficiency in fish. (Food and Agriculture Organization, Rome, October 28, 1964.)

Note: See Commercial Fisheries Review, February 1963 p. 85.



Portugal

CANNED FISH EXPORTS,
JANUARY-JUNE 1964:

Portugal's total exports of canned fish in oil or sauce during the first half of 1964 were at about the same quantity level as in the comparable period of 1963. Sardines accounted for 79 percent of the total canned fish exports in the first half of 1964.

Portugal's principal canned fish buyers during the first half of 1964 were Germany with 5,384 metric tons, the United Kingdom with 3,955 tons, France 3,242 tons, the United States 2,737 tons, Italy 2,461 tons, and Belgium-Luxembourg 2,205 tons. Germany's purchases of canned fish from Portugal

Portugal (Contd.):

Portuguese Canned Fish Exports, January-June 1963-64				
Product	January-June			
	1964		1965	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines	23,754	1,250	23,103	1,216
Chinchards	1,693	89	570	30
Mackerel	1,709	68	2,170	86
Tuna and tuna-like	610	20	1,003	33
Anchovy fillets	1,743	174	2,338	233
Others	405	21	162	8
Total	29,914	1,622	29,346	1,606

in January-June 1964 increased 13 percent from those in the same period of 1963. Purchases by the United Kingdom were up 10 percent, and those by France were up 25 percent. But purchases by the United States and Italy in the first half of 1964 were down 19 and 36 percent, respectively. (Conservas de Peixe, August 1964.)

PRIORITY FISHERY PROJECTS UNDER NEW THREE-YEAR ECONOMIC DEVELOPMENT PLAN (1965-1967):

Preliminary proposals under the new Portuguese Three-Year Economic Development Plan for 1965-1967 were announced by the Portuguese Minister of State on October 6, 1964, although the Plan must be reviewed further. The Plan includes Government and private investment projects considered most important by the Portuguese Government. Included are priority fishery investments in Continental Portugal totaling over US\$11 million and priority fishery investments in Portuguese Overseas Territories totaling over \$35 million.

In Continental Portugal, the priority fishery investments are mostly for the construction of new fishing vessels. The high rate of obsolescence in the Portuguese fishing fleet is of concern to the Portuguese Government, according to previous reports. Since 1959, the Portuguese Treasury has lent over \$14 million to the Fund for the Renovation and Equipping of the Fishing Industry.

Table 1 - Value of Portuguese Planned Priority Fishery Investments in Continental Portugal^{1/} During 1965-1967^{2/}

Sector and Project	Value	
	1,000 Escudos	US\$1,000
<u>Cod Fishery:</u>		
Construction of 3 trawlers of 2,800 gross tons each	102,000	3,570
Replacement and improvement of equipment on existing cod-fishing vessels	16,670	583
Total cod fishery	118,670	4,153
<u>Trawl Fishery:</u>		
Construction of 1 freezer-transport vessel of 3,000 gross tons	35,000	1,225
Construction of 4 steel coastal trawlers of 150 gross tons each	24,800	868
Construction of 2 wooden lobster trawlers of 300 gross tons each	20,000	700
Construction of 2 freezer trawlers (for shellfish) of 130 gross tons each	8,670	303
Construction of 5 offshore trawlers to work with freezer vessels	24,000	840
Total trawl fishery	112,470	3,936
<u>Sardine Fishery:</u>		
Replacement of old seine vessels by new vessels of 50 gross tons each; and reconstruction and improvement of existing equipment	5,340	187
<u>Tuna Fishery:</u>		
Construction of 4 offshore tuna vessels, each having a 100-ton fish-hold capacity	28,000	980
<u>Local Fishery:</u>		
Motorization, improvement of equipment, and repair of vessels	7,000	245
<u>Oyster Industry:</u>		
Nurseries and purification plants	800	28
<u>Marketing:</u>		
Freezing plants and sales stores at:		
Matosinhos	12,670	443
Figueira da Foz	1,470	52
Lisbon	8,000	280
Funchal (Madeira)	4,000	140
Horta (Azores)	5,340	187
Total marketing	31,480	1,102
<u>Support for Distant Fishing:</u>		
Equipment for freezing and storing fish	14,400	505
Total planned priority fishery investments in Continental Portugal	318,160	11,136

^{1/}Includes Madeira and the Azores.

^{2/}Preliminary.

Note: Escudos 28.58 equal US\$1.00.

Portugal (Contd.):

Table 2 - Value of Portuguese Planned Priority Investments in Overseas Territories During 1965/1967^{1/}

Territory	Research and Technical Assistance		Fishing Fleet		Land Facilities and Local Marketing		Total	
	1,000 Escudos	US\$1,000	1,000 Escudos	US\$1,000	1,000 Escudos	US\$1,000	1,000 Escudos	US\$1,000
Cape Verde	7,500	262	211,500	7,403	39,000	1,365	258,000	9,030
Angola	30,000	1,050	150,000	5,250	190,000	6,650	370,000	12,950
Mozambique	18,000	630	220,000	7,700	90,000	3,150	328,000	11,480
Guinea	4,500	158	6,000	210	7,500	262	18,000	630
S. Tome-Principe .	4,000	140	2,500	87	13,500	473	20,000	700
Timor	6,000	210	2,000	70	2,000	70	10,000	350
Total overseas territories . .	70,000	2,450	592,000	20,720	342,000	11,970	1,004,000	35,140

^{1/}Preliminary.

Most of the proposed priority fishery investments in overseas territories are in Angola (\$13.0 million), Mozambique (\$11.5 million), and Cape Verde (\$9 million). The proposed overseas fishery investments include substantial outlays for land facilities and local marketing as well as for fishing vessels. For research and technical assistance, the Plan proposes investment of over \$1 million for Angola, \$630,000 for Mozambique, and smaller amounts for other Territories. (United States Embassy, Lisbon, November 11, 1964.)

Note: See *Commercial Fisheries Review*, June 1964 p. 57.



Senegal

SENEGALESE TUNA INDUSTRY WILL RECEIVE AID FROM THE SOVIET UNION:

During the visit of Senegal's Foreign Minister to Moscow (October 25 to November 1, 1964), an agreement was signed between the 2 countries under which the U.S.S.R. will extend credits to Senegal amounting to about US\$6.7 million. The loan, bearing a 2.5 percent annual interest charge, will be repaid in Senegalese exports to the U.S.S.R. over 12 years. With the Soviet credits and technical aid, Senegal will construct a tuna cannery. The U.S.S.R. will also deliver to Senegal 10 tuna vessels, provide a team of technicians to operate the tuna cannery for the first 2 years, and sponsor a training program for Senegalese technicians in the Soviet Union.



Somali Republic

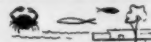
AID APPROVES LOAN FOR FISHERIES VENTURE:

The U. S. Agency for International Development (AID) has approved a \$543,000 loan to the Somali American Fishing Co., a joint organization of a Massachusetts firm and a Somali group. The loan will help finance a new fisheries plant near Alula on the northern tip of the Somali Republic bordering the Indian Ocean and the Gulf of Aden. The new plant will process and freeze fisheries products, mainly for export.



A local Somali fisherman weighing fish.

The loan will be made and repaid in United States dollars. Interest on the loan will be payable semiannually until June 30, 1967, and annually thereafter. Principal will be repayable in installments over a period of about 10 years beginning in 1967. (AID United States Embassy, Mogadiscio, October 22, 1964.)



South Africa Republic

FIVE TUNA VESSELS ORDERED BY FISHING FIRM:

A contract for the construction of five 300-ton all-steel refrigerated tuna fishing vessels, valued at US\$1.4 million, was awarded in August 1964 to a shipbuilding firm in Durban, South Africa, by a Cape Town fishing company. The contract is the largest that has been signed for the construction of vessels in South Africa. The first of the 5 vessels will be ready for delivery 8 months after placement of the order. The remainder of the vessels will be delivered--one every two months until the order is completed.

The vessels will be 110 feet long overall, with a beam of 22 feet, loaded draft of 9 feet, and with Diesel-powered engines capable of a speed of 12 knots. They will be fitted with 4 freezing tunnels of 10-ton capacity cooled to a temperature of -35° F. After freezing, the fish will pass to the main hold which will have a capacity of 88 tons with a temperature of -25° F. Each vessel will be fitted with fish-finding equipment, radiotelephone, and direction finders. Crew accommodations are provided for 18 persons.

Among the shipbuilding countries bidding for the contract were Holland, Spain, Denmark, and East and West Germany. It was reported that the strongest competition came from East German shipbuilders.

A spokesman for the Cape Town fishing company said the vessels will use the Japanese long-lining method for fishing tuna--laying 35 miles of long lines (carrying 2,000 hooks) to be hauled in every 24 hours. He added that the fishing waters around South Africa have a great potential and that this was only the beginning as far as tuna fishing was concerned. Plans were that the 5 new vessels would probably operate off Durban during the Cape off-season (March-October).

The company spokesman said his firm already had 3 refrigerated vessels and that a fourth was to be equipped with refrigeration facilities. In addition, the Cape Town fishing company recently purchased a 1,500-ton former Spanish motor vessel for transporting frozen shark and tuna from Cape Town to overseas markets. The company will export frozen tuna and shark. (The South African Shipping News and Fishing Industry Review, September 1964.)

NEW VESSELS WILL HELP DIVERSIFY FISHERIES:

To diversify its fishing activities, a South African fisheries group ordered a series of stern trawlers, long-liners, and purse-seiners from shipyards in the Netherlands. The first deliveries arrived late in the summer of 1964 and included the 150-foot stern-trawler Pionier I; the 83-foot tuna vessels Verkenner I and Verkenner II (designed to use long lines or purse/seines); and the 86-foot shoal fishing vessel Treffer I (designed mainly to use purse seines in the pilchard fishery, but also equipped to operate as a stern trawler). Delivery of the stern trawler Pionier II to South Africa was expected late in 1964.

Stern Trawlers: The stern trawlers in the Pionier series will supply a filleting and freezing plant near Cape Town which will produce frozen fillets or fish stick blocks for ex-

port. The plant is equipped with filleting machines and plate freezers. To keep that automated plant supplied with fish, the owners have invested in vessels of the most modern design. The Pionier I is capable of operating in almost any weather. Like the larger foreign trawlers working off the Cape, the Pionier I has the power, the net, and the winch to trawl down to 400 fathoms (2,400 feet). To assist in the handling of the trawl net (designed and made in west Germany from synthetic fiber), the vessel is equipped with a hydraulically-operated movable gantry.

When the net is brought up, the wings and cod-end are hauled over the stern ramp and on to the long afterdeck by the two inner drums of the winch. The cod-end is then lifted above a hydraulically-worked hatch cover, the bag is emptied, and the catch spills through the hatchway into bins in the lower deck. From those bins aft, the fish are carried forward on the starboard side to the hatches of the hold. That movement is done by conveyor where, working under cover, the crew head and gut the fish and send them through a special washing machine before feeding them through a funnel into the hold below.

Fish-hold capacity of the Pionier I is 14,330 cubic feet. The insulated hold is lined and partitioned with aluminum. It is cooled by two blower units of the vessel's gas refrigeration plant. Using that system, it is possible to keep the catch chilled at a constant temperature of 33° to 34° F. with only 0.4 tons of ice to a ton of fish.

The main engine of the 13-knot Pionier I is a 6-cylinder 4-stroke Diesel developing 900 b. hp. at 380 r.p.m. The engine acts on a 3-blade controllable-pitch propeller. The engine and the propeller pitch are controlled from the bridge. "More like a computer room than a trawler bridge," was the comment of one visitor when he saw the vessel's engine controls, electronic fish-finders, radar, automatic pilot, and other equipment.

Tuna Vessels: In late August 1964, the tuna vessels Verkenner I and Verkenner II arrived in Table Bay, South Africa, after completing delivery trips from the Netherlands. The vessels will be able to work from Cape Town, Walvis Bay, or any other harbor conveniently situated for tuna fishing. The Verkenners are identical vessels of 144 gross tons designed to fish well out to sea. Each is

South Africa Republic (Contd.):

equipped with a Diesel engine developing 435 b. hp. at 750 r.p.m. and acting on a fixed 3-blade propeller. The vessels cruise at 11 knots. Accommodations are provided for a crew of 10 or 11 who may have to spend 2 weeks or more at sea. In contrast to the typical South African pilchard vessel with aft deckhouse, the new tuna vessels have their large deck structure well forward, sharply raked stem, high foredeck stepped down to a large low aftersection, and prominent crow's nest near the top of a tripod mast amidships.

The total fish-hold capacity of each of the new tuna vessels is 40 tons. Each vessel has 6 fish holds situated below hatches on the aft working deck. The holds are refrigerated by an ammonia gas system.

During fishing operations, freshly-caught tuna are placed in a hold filled with sea water cooled to just above its freezing point of 29° F. There the tuna are chilled for two days. Salt is then added to the water and the temperature reduced to 22° F. After another 2 days, the brine is pumped out and the temperature of the dry hold brought down to between 10° and 15° F. The tuna can be thawed by pumping sea water back into the hold. That may be done shortly before landing.

Soon after their arrival, the Verkenners were fitted with Japanese-type line haulers which will work 200 baskets (34 miles) of long line. When tuna are brought to the stern as the long line is hauled in, they are lifted with the aid of an electric deck winch.

If tuna schools are found in sufficient concentration to permit purse-seine fishing, each of the Verkenners can be fitted with a power block on the boom. Purse-seine gear would be worked in conjunction with a multipurpose hydraulic winch which would be placed on a base already prepared on the afterdeck.

Shoal Fishing Vessels: Similar in appearance to the Verkenners, the new seiner-trawler Treffer I has been designed to fish for pilchards with a purse-seine net during the South African shoal fishery. During the off-season for pilchards, the Treffer I will be fitted with gallows and gantry and will operate as a stern trawler.

In deciding to fit the Treffer I with a purse seine rather than a lampara seine, the owners

were influenced by the success of the Brand and the Kruger with purse seines in the pilchard fishery. The Treffer I has an all-hydraulic system for handling the net. It also has a power block on the boom, and a multi-purpose winch. The main engine of the vessel develops 420 b. hp. at 750 r.p.m. and acts on a controllable-pitch propeller. The vessel is equipped with an echo-sounder set to locate fish schools ahead and on either side of the vessel. It also carries a vertical echo-sounder and radar equipment. (The South African Shipping News and Fishing Industry Review, September 1964.)

PILCHARD-MAASBANKER FISHERY, JULY 1964:

South Africa Republic: The Cape west coast pilchard-maasbanker season ended July 31, 1964, with the total catch well below that of the previous year. During 1964, fishermen were handicapped by bad weather and uncertain movements of fish schools.

The 1964 Cape west coast shoal fish catch through July 1964, when the pilchard season closed was 282,301 short tons pilchards, 22,121 tons maasbanker, 57,222 tons mackerel, and 25,709 tons anchovy. The total catch was 387,353 tons. In 1963, the catch was 441,943 tons pilchards, 12,827 tons maasbanker, and 14,634 tons mackerel, for a total of 649,404 tons. (There were no anchovy landings in January-July 1963.)



A Cape west coast pilchard and maasbanker cannery and fish reduction plant.

The shoal fish catch off the Cape west coast of South Africa Republic in July 1964 was 25,698 tons pilchards, 2,169 tons maasbanker, 1,903 tons mackerel, and 8,762 tons anchovy for a total of 38,532 tons. That compares with 64,726 tons pilchards and 35 tons maasbanker landed in July 1963.

The July 1964 catch yielded 9,184 short tons of fish meal, 426,242 imperial gallons of fish-body oil, 778,536 pounds of canned mackerel, 495,876 pounds of canned pilchards, and 228,672 pounds of canned maasbanker.

South-West Africa: At Walvis Bay in South-West Africa, the pilchard catch amounted to 499,881 tons during January-July 1964. The fishery in South-West Africa expected to continue until the 8 licensed factories had their combined catch quota of 720,000 tons.

By early September 1964, 4 of the 7 pilchard processing factories at Walvis Bay were scheduled to complete their 1964 quotas of 90,000 tons each. The three remaining factories at Walvis Bay were scheduled to finish by November.

South Africa Republic (Contd.):

No probable closing date was reported for the new factory at Luderitz. (The South African Shipping News and Fishing Industry Review, September 1964.)

LARGE-SCALE TEST OF NEW ANCHOVY FISHERY PLANNED:

A total catch of about 21,500 short tons of anchovy was delivered between April 1-July 15, 1964, by a limited fleet of 5 or 6 vessels of the South Africa Republic. A much larger commercial test of the coastal anchovy resource is under way. About 50 vessels have been granted permission to use the special $\frac{1}{2}$ -inch-mesh knotless purse-seine nets needed in the anchovy fishery. The nets--costing about R8,000 (US\$11,200) each--had to be imported, so the large-scale test was delayed for a brief period. But 15 of the nets had arrived by the end of July 1964 and the remainder were expected to follow in a short time. Each of the 14 fish-meal factories in the South Africa Republic was allocated 3 anchovy nets. Reports indicate that each fish-meal factory in South-West Africa was assigned one anchovy net.

The anchovy fishery of the South Africa Republic is being allowed to continue without any definite closing date (the Cape west coast pilchard fishery closed July 31, 1964); and the South-West African fish-meal factories are not subject to anchovy catch limits such as are assigned for the pilchard fishery.

The anchovy catches are being processed into fish meal and oil. The anchovy taken in mid-1964 were smaller with a lower oil content than earlier in the year. That may indicate some seasonal change in the resource. (The South African Shipping News and Fishing Industry Review, August 1964.)

ANCHOVY FISHERY, AUGUST 1964:

Summary: The new anchovy fishery of South Africa received its first large commercial test in August 1964. Bad weather, however, made it difficult to handle the special purse-seine nets used in the fishery. (The 14 fish meal factories in the South Africa Republic have each been allocated 3 anchovy nets; the 8 fish meal factories in South-West Africa have been allocated 2 anchovy nets.) South African fishermen will continue the test of the anchovy fishery, which is not subject to catch limit or definite closing date.

South Africa Republic: With the close of the Cape pilchard season at the end of July 1964, shoal fishermen got down to the hunt for anchovy. During that month, 20 to 25

vessels took on the necessary small-mesh purse-seine nets and went after anchovy from Lambert's Bay to east of Gansbaai. They were hampered, however, by bad winter weather, and also had trouble finding shoals in sufficient concentration. The estimated catch in August was around 4,000 short tons.

By the first week in September 1964, more than 40 Cape vessels were reported to be engaged in anchovy fishing.

South-West Africa: Early anchovy fishing operations off Walvis Bay have not been very successful. This has been due mainly to bad weather and turbulent seas which have made it difficult for vessel and crew to handle the heavy gear used in the fishery.

The first anchovy net arrived in Walvis Bay during the first week of August 1964. The net was transferred to the shoal fishing vessel Marie Christine. On her first trip the vessel was able to catch only about 4 tons of very small anchovy. The fish were about 2 inches long and were very lean. They went "soft" within a few hours. As the weather improved, catches of up to 12 tons were made later in the month.

A second anchovy net was scheduled to arrive at Walvis Bay during the first week of September 1964.

Each factory at Walvis Bay is allowed to use two anchovy nets. No restriction has been placed on the size, quantity, or season in which anchovy may be caught. However, all pilchards accidentally caught in the anchovy nets will be deducted from 1965's pilchard quota for the respective factory. (The South African Shipping News and Fishing Industry Review, September 1964.)

PRODUCERS REPORT STRONG DEMAND FOR WALVIS BAY FISHERY PRODUCTS:

The South African fishing industry would not meet its fish meal obligations in 1964 if an additional quota was not granted Walvis Bay factories in South-West Africa, according to the Chairman of the South Africa Fish Meal Producers Association. (Editor's Note: Previous reports indicated that the South-West Africa Administration had denied a requested increase of 60,000 short tons in the 1964 Walvis Bay pilchard quota.)

The Chairman emphasized that the industry had not over-speculated on its production. There were, however, two factors which had upset industry planning. First, Philippine orders for a substantial quantity of canned fish were not received until the spring of 1964. As a result, the fish used for canning left the industry short about 10,000 tons of meal. Second, adverse weather off the Cape West Coast of South Africa during May, June, and July 1964 had reduced the expected catch, and caused meal production on the Cape to fall 15,000 tons below estimates.

In late summer 1964, the Chairman of the South Africa Fish Meal Producers Association commented on export markets for Walvis Bay fishery products as follows:

Fish Meal: The market has remained very good. Japan has asked South African producers for an additional 15,000 tons of fish meal this season. That was a request, however, and not a commitment.

The Chairman said, "In the light of this year's experience, we will have to be very careful in planning production and sales for 1965 in order not to land ourselves in the predicament of not being able to meet obligations and thereby harm our prestige."

Canned Fish: Demand for South African canned fish appears to be improving, especially in the United Kingdom.

South Africa Republic (Contd.):

The 1964 contract with the Philippines was the largest canned fish contract ever concluded by the South African industry. The contract called for 437,500 cases of fish to be shipped to the Philippines by the end of August 1964. A second shipment of half a million cases of canned fish to the Philippines was scheduled to be made by the end of October 1964.

Fish Oil: The entire South African production of fish oil in 1964 has been sold to the United Kingdom. (*The South African Shipping News and Fishing Industry Review*, September 1964.)

PURSE-SEINE NETS MAY REVOLUTIONIZE CAPE SHOAL FISHERY:

With few exceptions, most South African Cape shoal fishermen would rather forget the 1964 pilchard season. In seven months of often unfavorable weather, uncertain movements of pilchard schools, and other difficulties, good fishing was always just around the corner. The total catch was down and individual hauls were disappointing. But the catch was not disappointing for two skippers using purse-seine nets. Their crews not only brought in more than an average share of pilchard but also dipped well into the anchovy shoals.

The great South African pilchard fishery of the Cape and Walvis Bay has been built on the lampara seine, which is shallower than most purse seines and easier to handle.

In South Africa, the lampara seine has graduated from 50-foot to 70-foot vessels, from cotton to the strongest synthetic fibers, and from laborious hand-hauling to the swift power block. In spite of those advances, the lampara net could be on its way out and could take with it the conventional deckhouse-aft vessel.

Some advantages of the purse-seine net over the lampara net were demonstrated in 1964 by the Kruger and the Brand. Each of those 67½-foot wooden vessels was adapted for purse-seine fishing by rebuilding the upper section, moving the deckhouse far forward, and placing a power block on a boom over an aft working deck.

In November and December 1963, the converted purse-seiners Kruger and Brand were among the six Cape vessels engaged in early test fishing for anchovy, and in January 1964

they joined the hunt for pilchard. By July 31, 1964, at the end of a season in which 130 vessels (equipped mainly with lampara nets) caught an average of 2,169 tons each, the Kruger had brought in 7,700 tons (60 percent pilchards and 40 percent anchovy), and the Brand had landed 6,545 tons (80 percent pilchards and 20 percent anchovy).

Those vessels are part of the fleet still fishing for anchovy. (*The South African Shipping News and Fishing Industry Review*, September 1964.)

NEW TRAWLING COMPANY BACKED BY SPANISH-SOUTH AFRICAN INTERESTS:

With a modern fleet and a factory and distribution facilities able to handle an initial 20,000 to 25,000 short tons of trawl fish a year, a new R1.5 million (US\$2.1 million) fisheries company will come into operation in April 1965 on the South African Cape west coast. It will be based at Saldanha Bay.

The new trawling venture is backed by two South African companies and by a Spanish fishing concern whose distant-water trawlers have been working off the South African coast since the end of 1962.

An official of the new trawling company said it will erect a large and very modern processing factory at the shore end of what is known in Saldanha as the Government dock. There an initial fleet of six trawlers will land catches almost alongside processing facilities. A 1,000-ton cold-storage warehouse and a railway siding will also be located close to the factory. Fish handling will be reduced to a minimum by the close proximity of the dock, factory, and loading point.

The fish-processing plant of the company is being designed with emphasis on automatic handling of that portion of the catch which will be used to produce frozen fillets, fish sticks, fish blocks for processors overseas, and smoked fish. Two filleting machines will be installed in the plant.

Export sales of processed fishery products and fish meal will be made by the new company. But it will also supply chilled fish for marketing in South Africa.

Waste fish and offal from operations will be processed into fish meal. A reduction

South Africa Republic (Contd.):

plant with a capacity of 100 tons of raw fish in 24 hours has been ordered from West Germany for that work.

The Spanish-built stern trawlers which will form the fleet of the new company are 107½ feet long overall, with a gross tonnage of 218 tons. Their service speed is 12 knots. They carry a net which is handled by means of a gantry system working over a transom stern. At the forward end of the deck is a 98-horsepower electric winch, with two main drums and an auxiliary drum.

Fish hold capacity of each of the vessels is about 75 tons in 6 holds. The fish holds are insulated with a wood-cork-plastic "sandwich" layer, and are cooled by a sea water circulation system chilled to -2° C. (+28.4° F.).

It has not been decided whether the new trawling company at Saldanha Bay will acquire 6 of the stern trawlers, or whether it will take 4 stern trawlers plus 2 larger side trawlers equipped to freeze their catch at sea. The side trawlers would have an overall length of 147½ feet. Each side trawler of that type could carry 225 tons of frozen fish.

All of the vessels obtained from Spain will come fully equipped and will have a Spanish crew.

The Spanish partner in the new company at Saldanha Bay will be an active participant in the venture. But the Spanish partner will continue separate distant-water operations off South Africa using the stern and side trawlers which have become familiar callers in Table Bay Harbor. Hake caught by those vessels is shipped out in refrigerated transports for sale in Spain. (The South African News and Shipping Industry Review, August 1964.)

Note: See Commercial Fisheries Review, July 1964 p. 73.



Spain

TRAWLING OFF SOUTH AFRICA ATTRACTS MORE SPANISH VESSELS:

Following is a report from The South African Shipping News and Fishing Industry Review, August 1964, on the expansion of Spanish trawling activities off South Africa:

A leading Spanish fishing company is expanding its trawling operations off South Africa, which it began in 1962. The Spanish company is joining with South African interests on a trawling venture to be based at Saldanha Bay.

At the end of July 1964, another Spanish company was considering Cape Town, South Africa, as a base for one and possibly more trawlers.

A third Spanish company sent the 242.5-foot freezer-trawler Toula to South Africa late in the summer of 1964. The vessel's high freezing capacity--about 69 tons per day--indicates it may be intended as a mothership for other trawlers. The Toula has 8 blast-freezing tunnels, each of which can freeze about 5,800 pounds of fish in 10 hours in an air temperature of -40° F. It also has 2 plate freezers with a combined capacity of 1 ton an hour.

It has been asked how large and expensive fishing vessels working thousands of miles from their home ports can be made to pay. One answer to that question can be found in the report of an interview with a Spanish hake fisherman described as the skipper of a pair-fishing trawler operation in Northern Hemisphere waters. He said that hake was the fish people wanted and was of prime importance in the Spanish market. When sold on the Spanish market, frozen hake from South Africa probably would bring a price not far below that for fresh hake. (Editor's Note: During January-March 1964, ex-vessel prices at Vigo, Spain, averaged 38.3 U. S. cents per pound for hake and 20.0 cents per pound for small hake.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 78, and Aug. 1964 p. 85.



Togo

FISHERIES TRENDS, JANUARY-OCTOBER 1964:

Togo's fishing fleet consists mainly of canoes and other small craft. Togo's domestic fisheries production is supplemented by foreign landings of frozen tuna and frozen sardines at Lome wharf. Frozen sardines are brought in almost exclusively by Soviet vessels. The foreign tuna landings are usually from Japanese or Soviet vessels. French and Spanish vessels occasionally land at Lome.

Togo (Contd.):

(A number of other foreign vessels operate off Togo, but land their catch elsewhere.) Tuna sold in Togo is usually smoked for local consumption. Sardines find ready acceptance in all but the most remote villages of Togo. Canned sardines are imported by Togo from France, but the supply still falls short of the demand. Imports of frozen fish via the Lome wharf during January 1-August 31, 1964, amounted to 3,571 metric tons.



An FAO fishery expert demonstrates gutting to fishermen because in Togo fish are usually dried without cleaning and gutting.

The Togolese Government would like to develop its own fishing industry. To that end, Togo extended its territorial waters to 12 miles during the summer of 1964. The Government of Togo plans harbor improvement work at Lome, and has accepted a West German aid project to supply Togo with two trawlers about October 1965 when the new port development has provided sufficient anchorage. To help its domestic fishermen, the Togolese Government is also considering increasing taxes on imported fish.

The Togolese Government has received about 20 requests from foreign fishing firms which would like to operate out of Lome when the harbor improvement work is completed. The requests are mainly from French and Italian nationals as well as Liberians and Ghanaians. (United States Embassy, Lome, November 20, 1964.)

Note: See *Commercial Fisheries Review*, Sept. 1964 p. 79; July 1964 p. 74; July 1963 p. 93; Jan. 1963 p. 118.



U.S.S.R.

STATUS OF FLEET OF
LARGE STERN TRAWLERS:

The Soviet Union's fleet of large stern trawlers as of September 1964 was composed of at least 170 stern factory trawlers of 5 different classes, according to reports from various sources.

Soviet Fleet of Large Stern Trawlers by Class and Tonnage as of September 1964

Class	No. of Vessels	Gross Tons Per Vessel	Country of Construction	Date of Construction
<u>Pushkin</u>	24	2,470	West Germany	1956-8
<u>Maiakovskii</u>	86	3,170	U.S.S.R.	1958
<u>Leskov</u>	20	2,800	Poland	1960-64
<u>Tropik</u>	30	2,600	East Germany	1962-65
<u>Kosmos</u>	10	2,900	Poland	1963

The Maiakovskii and Kosmos class series were scheduled for continued construction throughout 1964. From 1 to 2 Maiakovskii class vessels were built each month at the Nikolaev Shipyards (on the Black Sea). Tropik class vessels, built at People's Shipyards (Volkswerft) at Stralsund (on the Baltic Sea) will continue to be built for the Soviet Union until the end of 1965, when a total of 65 vessels will have been delivered. Of that total, 22 vessels were to be delivered during 1964, and 23 will be delivered in 1965. Reports are that after 1965, East German shipyards may continue the construction of Tropiks for their own fishing fleet. (Le Marin, June 5, 1964; Nordseezeitung, various 1964 issues and other publications.)

SOVIET FISHING VESSELS OFF
NORTHEASTERN COAST OF JAPAN:

Large numbers of Soviet fishing vessels appeared off the Sanriku (Northeastern) coast of Japan in November 1964. The Soviet fish-

U.S.S.R. (Contd.):

ing fleet (organized on the basis of one 2,500- to 3,000-ton class mothership to every ten 200- to 300-ton fishing vessels) was reported fishing for saury. Unlike 1963 when the Soviet vessels were observed to be test fishing with suction pumps, the great majority of the vessels in 1964 was using the Japanese method of fishing with lights and pole-held dip nets.

Later that month, a report received by the Japan Maritime Safety Second District Headquarters indicated that two 8,000-ton mother-ships accompanied by some 10 vessels were fishing for saury about 17 miles southeast off the Shiogama (Miyagi Prefecture) lighthouse. (Minato Shimbun, November 21; Suisancho Nippo, November 14, 1964.)

ELECTRICAL FISHING WITH LIGHTS AND PUMPS:

Following is a description of Soviet light-and-pump-fishing methods as reported by a member of the Soviet State Committee for Fisheries and published in World Fishing, June 1964:

Caspian Sea: Soviet fishermen are using lights and pumps in the Caspian Sea to catch sprat on a commercial scale. (The method was first used in 1954 to catch Caspian sprats.) At night, bright lamps and a suction system are lowered into water where fish



Lights and pumps used to fish sprat ("kilka") in the Caspian Sea off Baku. Man on left stands on the drive-shaft housing between the electric driving motor (left) and the fish pump (near his right foot). Suction hose can be seen passing under the fish box and over the railing (right rear). Man on the left is holding on to water-fish separator; fish trickle down the chute into hopper (center) while the water flows back into the sea (left rear).

schools are expected to pass. The suction system is hauled aboard at dawn. When the tip emerges from the water, the lights are put out and the water is promptly pumped out of the hoses, which bob up and are pulled on board.

At present, suction fishing in the Caspian Sea is done by large vessels fitted with 1 or 2 pumping systems. Equipped in that manner, a vessel of 700 tons displacement can catch up to 70 metric tons a night. By 1963, Soviet fishermen in the Caspian Sea were catching more fish with suction pumps than with nets (see table). In some cases, a vessel with pumps produced 2 or 3 times more than a comparable vessel fishing with nets. The use of pumps also save a lot of manual effort.

Soviet Sprat Catch in the Caspian Sea by Nets and Pumps, 1963 with Comparisons			
Year	Nets	Pumps	Total
	(1,000 Metric Tons)		
1963	122.0	136.7	258.7
1962	132.7	92.0	224.7
1957	149.1	25.9	175.0
1954	91.3	0.1	91.4

Pacific Ocean: The Soviets are testing a modified pump-fishing method on saury in the Pacific. Early experiments showed that saury could evade an ordinary pump even though the fish were attracted by the lights in the suction-fishing system. It was found, however, that saury could be trapped by an electrical field. In a direct current electric field, saury instinctively move in the direction of the anode.

Those principles were used in the modified pump system designed to catch saury. The modified gear includes a fish pump and a direct current electrical unit (9 kilowatts, 30 volts, 400 amperes) to build up an electric field where saury are concentrated. Two steel pipes lowered into the water from the bow and stern of a fishing vessel serve as the cathode of the electrical system. The suction pump, with an insulated outer surface serves as the anode.

When the system is operating, saury are lured into the effective zone of the pump by a 500-watt red-light source placed 0.5 to 1.0 meters (1.6 to 3.3 feet) above the water surface and aligned with the center of the suction pump under water. Direct current applied to the electrodes 5-10 seconds after the red light is put on attracts fish to the suction pump (the anode), and the pump sucks the fish in.

U.S.S.R. (Contd.):

Using that method, the Yuri Gagarin (a medium trawler) took more than 50 tons of saury in 12 days. One night the catch reached 20 tons, which evidently is not the limit.

Note: See Commercial Fisheries Review, July 1964 p. 76.

FACTORY-TYPE WHALING
IN NORTH PACIFIC OCEAN:

Whaling operations in the North Pacific Ocean by the Soviet Union were described by the Director of Japan's Whale Research Institute, in an article appearing in the Japanese periodical Geiken Tsushin (Whaling Report) No. 135, July 1964. A summary translation of the article follows:

The U.S.S.R. has a long history of factory-type whaling in the North Pacific. The mother-ship Aleut was the only vessel engaged in that type of whaling before World War II. After the war, in addition to operating the Aleut, the U.S.S.R. established a land-based whaling station on the Kuriles. This station is still maintained and operated although there have been rumors that it would be abolished. In recent years emphasis has been placed on the expansion of pelagic whaling, and as of mid-July 1964 four factoryships were engaged in whaling in the North Pacific. In 1962, the vessel Sovietskaya Russia which had been engaged in Antarctic whaling joined the Aleut in the North Pacific operation. In 1963, two newly constructed vessels (the Dalni Vostok and the Vladivostok) were added to the fleet.

The catch of whales by the Soviet mother-ship fleet for 1963 included an especially large number of blue, humpback, and sperm whales during that year. A total of 9,291 whales was taken by the Soviets in the North Pacific Ocean in 1963. Of that total, 347 were blue whales, 2,242 humpback whales, and 5,125 sperm whales. At the current rate of catch blue and humpback whales will become extinct.

From 1959 to 1963, the Soviet Union expanded its whale fishery eastward. During the 1963 season it had expanded its whaling area eastward to include the entire Gulf of Alaska, with the Soviet fleet operating that year east of 130 degrees west. In addition to the expansion of the fishing area in the Gulf of Alaska in 1963, the U.S.S.R. was engaged in whaling in the North Bering Sea. Thus all waters of the North Pacific, with the exception of the Arctic Ocean are covered by

the U.S.S.R. whaling fleet. (Fisheries Attache, United States Embassy, Tokyo, November 6, 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 114; November 1964 p. 16; September 1964 p. 10.

SOVIET WHALING FLEET PLANS
PRESEASON HUNTING IN ANTARCTIC
FOR TOOTHED SPERM WHALES:

A British periodical reported in mid-October 1964 that the Soviet joint whaling fleet of Sovietskaya Ukraina and Slava was ready to leave for the Antarctic.

The captain of the Soviet expedition said it would sail along a new route via the Suez Canal. That would make it possible to reach the whaling area two weeks earlier than usual, and to begin hunting toothed sperm whales which, according to the International Whaling Convention, can be caught at any time of the year. (Fishing News, London, October 16, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 72.



United Kingdom

FISHING LIMITS EXTENDED
TO 12 MILES:

The extension of British fishing limits to 12 miles became effective September 30, 1964. At the same time, straight baselines enclosing a number of bays and channels were established by the Territorial Waters Order-in-Council of the British Government. The waters of the Scottish Hebrides Islands are the most notable area enclosed by the new baselines. English waters enclosed include Bristol Channel and The Wash.

Certain rights to continue fishing within the new British limits have been extended to fishing vessels of the foreign countries which endorsed the European Fisheries Convention. Those countries are Belgium, Denmark, France, West Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Austria, and Sweden. Fishing vessels of those countries will be allowed to fish within the British 6- to 12-mile zone, but only for the stocks and on the grounds which they have habitually fished during the 10 years ending in 1963. They will also, for an initial transitional period, be allowed to fish in areas with-

United Kingdom (Contd.):

in the 3- to 6-mile British zone where traditional rights have been established.

Along most of the British coast, foreign fishing in the 3- to 6-mile zone will end on December 31, 1965, but where straight base-lines or bay-closing lines more than 10 miles in length are drawn, the transitional period extends until the end of 1966. The end of the transitional period will see foreign vessels completely excluded from the inner 6 miles of the new British 12-mile limit.

The habitual rights of the various Convention countries have been defined in a series of Designation Orders by the British Government, specifying the areas and species which the vessels of each country may fish.

Similar orders have also been made giving effect to bilateral agreements with two countries which are not parties to the European Fisheries Convention, but which have fished within the new limits. An agreement has been made with Norway giving Norwegian vessels the right to fish for dogfish and basking sharks in certain areas between 6 and 12 miles until 1984, with transitional rights between 3 and 6 miles for those fish only.

A second agreement has also been concluded giving Polish vessels the right to fish for herring between 6 and 12 miles along part of the northeast coast of England until the end of 1967. Discussions have also been held with the U.S.S.R. The Soviets, however, seem mainly interested in securing the right to enter sheltered British waters to transfer catches to motherships.

Foreign vessels fishing within British fishing limits will be subject to British fisheries jurisdiction. British conservation regulations were extended to foreign vessels within the 12-mile limit by the British Sea-Fishing Industry (Nets of British and Foreign Fishing Boats) Orders 1964, which went into effect on November 1, 1964. (*Fishing News*, London, October 2, 1964.)

Note: See *Commercial Fisheries Review*, September 1964 p. 49; May 1964 p. 40.

CANNED SARDINE SUPPLY SITUATION:

It appears that there are no large quantities of canned sardines stored in the United Kingdom. The leading British firm

producing canned sardines can accept no large orders, according to its managing director. He said that most of the current British production of canned sardines had been sold. He also indicated that there is normally little carryover of canned sardine stocks in Britain from year to year. Sprat canned in the United Kingdom is sold for export as sardines, but on the British market it is labeled brisling. Some canned brisling is also imported from Norway. Also, there are imports of canned sardines mostly from Portugal--the only fish product permitted to be sold on the British market as sardines.

Sprat are caught off the east coast of Great Britain. There is no legal limit on the British sprat season; it is controlled only by the availability of the fish in coastal waters. In general, British fishermen catch sprat from October to February off the English coast and from September to February off the Scottish coast.

The British Ministry of Agriculture, Fisheries, and Food reported total sprat landings in English and Welsh ports during 1963 of 6,163 long tons with a total ex-vessel value of £83,179 (US\$232,901). That represents a rise of only 100 tons over the 1962 landings. Sprat landings in Scottish ports, however, established a record during the 1962/63 season when 30,000 long tons were landed, or 3 times as much as in any previous postwar season, according to the British Department of Agriculture and Fisheries for Scotland. It was stated that cold weather may have helped bring large schools of sprat into coastal waters during the 1962/63 Scottish season.

There are approximately 6 British plants classifiable as sardine canneries, although all of them process other types of fish and, in some cases, vegetables and other foods. To the extent possible, sprat are processed immediately after being landed. Normally, about one-half the catch is canned during the fishing season; the remainder is frozen and canned during the rest of the year. The majority of workers in British sardine canneries are women; they are paid on a piece-work basis; and their weekly average wage is about \$28.00. (United States Embassy, London, November 11, 1964.)

NEW BRITISH IMPORT SURCHARGE DOES NOT APPLY TO FISH AND FISH PREPARATIONS NOR TO CERTAIN FISHING VESSELS:

Foodstuffs and basic raw materials are not subject to the new temporary import ad valorem surcharge (15 percent) levied by the British Government as of October 27, 1964. Fish (tariff 03.01-03.03) and preparations of meat and fish (tariff 16.01-16.05) are covered by the exemption for foodstuffs.

Also excluded from the new import surcharge are fishing vessels of 80 gross tons or more (tariff 89.03A) and fishing vessels of the kind commonly known as Danish-type seiners (tariff 89.01B).

The temporary 15-percent import surcharge will be in effect until November 30, 1965, when it may be renewed for a further period of not more than 1 year. But the British Government also will review its balance-of-payments position in the spring of 1965 to determine if the surcharge can be reduced or

United Kingdom (Contd.):

abolished before November 30, 1965. (British Record, Nos. 14 and 17, November 1964.)

UNDERWATER "SOUND WAVE SEARCHLIGHT" DEVELOPED FOR FISHERIES USE:

British scientists have developed an underwater "sound wave searchlight" with a maximum range of 100 yards. At that range, it is said to be much more effective than traditional echo-sounding equipment. The "sound wave searchlight" is said to give a more detailed picture of the underwater world.

Sound waves, which travel 5 times as fast in water as they do in air, have been used for many years in underwater detection devices. They, however, produce a fixed beam, which gives its results simply as an echo or no echo. The new "searchlight" is reported to be more of the equivalent of an underwater radar. It transmits sound at 500 kilocycles a second in pulses 100 millionths of a second in length in a beam 30 degrees across. The maximum range is 100 yards.

Echoes from the transmitted sound are "scanned" electronically across the beam at speeds up to 10,000 times a second. That means that the resolution--or how well the equipment can distinguish objects--is extremely good; something only 6 inches in length is discernible. Output from the echo signal is presented on a television-type tube so that the range and bearing of the moving "blips" can be seen easily.

Sea trials have confirmed the performance of the equipment, which is now being manufactured for commercial tests. It had previously been used in laboratory research on fish behavior. (The South African Shipping News and Fishing Industry Review, August 1964.)



Viet-Nam

INCREASE IN SHRIMP EXPORTS PLANNED:

In 1964 Viet-Nam made trial shipments of frozen shrimp for market testing in the United States, Europe, and Asiatic countries. During the year, repeat shipments of frozen

shrimp amounting to some 35,000 pounds were made to Hong Kong, Japan, France, Holland, Switzerland, and the United States.

Viet-Nam's fishery products exports, including shrimp, were expected to increase with the completion of additional fish landing facilities in that country. (United States Embassy, Saigon, November 6, 1964.)



Yugoslavia

TUNA VESSELS BEING BUILT WITH AID OF FOREIGN KNOW-HOW:

Three 145-foot tuna purse seiners designed by a United States firm in Seattle, Wash., are under construction by a shipyard in Pula, Yugoslavia. Deliveries to a Yugoslavia fishing company, also of Pula, are scheduled for May, July, and September 1965.

The vessels will have a carrying capacity of 475 metric tons of tuna. Engines of 1,560 horsepower will be supplied by a Yugoslav firm which will build the engines under license from a Danish firm.

Hydraulic-powered fishing gear, including power blocks, main seine winches, and other deck machinery, will be supplied by the Seattle designing firm. (The South African Shipping News and Fishing Industry Review, September 1964.)

CANNED FISHERY PRODUCTS OUTPUT, 1963 AND JANUARY-JUNE 1964:

In 1963, Yugoslavia produced a record 27,452 metric tons of canned fishery products,



Women at a Yugoslav cannery preparing fish for cooking in wire baskets prior to canning operations.

Yugoslavia (Contd.):

exceeding 1962 production by 8,079 tons or about 30 percent. During the first 6 months of 1964, Yugoslav output of canned fishery products reached 14,046 metric tons, only 8

percent above production in January-June 1963. That indicates the trend toward increased canned production, which started in the late 1950's, will continue, though on a more modest scale. (Savezni Zavod Za Statistiku Indeks, September 1964.)



SEA OTTER POPULATIONS MAY BE TRANSPLANTED TO MORE ACCESSIBLE SITE

Sea otters have been absent from the Alaska "Panhandle" for a half century or more but may once again occupy that eastern portion of their former habitat. From communities in the more remote parts of the Aleutian Islands, which remained untouched by hunters during the latter part of the 18th into the 19th centuries, the otter has spread again through much of its former range.

Otters are now becoming more abundant in parts of Prince William Sound in Alaska. Plans are being made by the Alaska Department of Fish and Game to help them migrate south and east from there to the Alexander Archipelago, an area consisting of numerous islands in the waters of southeastern Alaska.

An aerial and SCUBA search by biologists of the Alaska Department of Fish and Game this past April disclosed at least one area in the Panhandle where a proposed transplant of sea otters would have an excellent chance of success. According to the biologists, the proposed release site on the west side of Chichagof Island has a good supply of sea otter requirements. These requirements include food of the proper kinds, protected rocky and sandy beaches, and isolation from human activities.

The chief biologist of Alaska's Division of Game, who is in charge of transplants, said that the remaining major obstacle to a full-scale reintroduction of the otter to a new area, is the difficulty in capturing an adequate number of them within a short enough period of time so that none would have to be kept long in captivity. Sea otters depend on their thick fur for insulation, he pointed out, and when it becomes matted--as it is prone to do quickly in captivity unless elaborate and costly facilities are provided--the animals get wet to the skin and die from exposure.

The Department's biologists are trying to devise a capture method which will improve on the one-by-one, two-or-three-a-week methods which have heretofore been used. An attempt to use a "cannon net," like those used for capturing some kinds of birds, was unsuccessful when tried earlier, partly because of weather conditions.

The biologist in charge of the Alaska Division of Game's sea otter investigations said that if a promising capture method could be found reasonably soon, a small pilot transplant of the otters was to be attempted before the end of 1964. Full-scale moving of sea otters could then begin in 1965, utilizing experience and knowledge gained in the pilot transplant. The animals will be moved from Prince William Sound to Chichagof by amphibious airplane, the biologist said. (Alaska Department of Fish and Game, Juneau, May 1, 1964.)



FEDERAL ACTIONS



Department of Health, Education, and Welfare

PUBLIC HEALTH SERVICE

AMENDMENTS PROPOSED TO REGULATIONS FOR MEDICAL CARE OF COMMERCIAL FISHING VESSEL OWNER OPERATORS:

A notice to amend regulations on eligibility for medical care of owner-operators of commercial fishing vessels (5 gross tons and over) under Part 32 Title 42, Code of Federal Regulations (Medical Care for Seamen and Certain Other Persons), was issued by the U. S. Public Health Service, Department of Health, Edu-

cation, and Welfare, and published in the Federal Register, November 10, 1964.

The proposed amendments to Part 32 are on sections covering meaning of terms, persons eligible, and conditions and extent of treatment.

It is proposed to make any amendments that are adopted finally effective immediately upon publication in the Federal Register.

Interested persons were given until December 10, 1964, in which to present data, views, and arguments in writing regarding the proposal.

The proposed regulations as they appeared in the Federal Register follow:

DEPARTMENT OF HEALTH, EDU- CATION, AND WELFARE

Public Health Service

[42 CFR Part 32]

MEDICAL CARE FOR SEAMEN AND CERTAIN OTHER PERSONS

Notice of Proposed Rule Making

Notice is hereby given that the Surgeon General of the Public Health Service, with the approval of the Secretary, proposes to amend Part 32 of Title 42, Code of Federal Regulations. As set out below, the amendments relate to eligibility for medical care of owner-operators of commercial fishing vessels.

Notice is also given that it is proposed to make any amendments that are adopted effective immediately upon publication in the FEDERAL REGISTER.

Interested persons may present data, views, and arguments in writing, in duplicate, to the Surgeon General, Public Health Service, Washington, D.C., 20201. All relevant material received not later than 30 days after publication of this notice in the FEDERAL REGISTER will be considered.

Part 32 would be amended as follows:
1. Section 32.1 would be amended by

adding a new paragraph (1), to read as follows:

§ 32.1 Meaning of terms.

(1) "Commercial fishing operations" means the gathering of any form of either fresh water or marine animal life for sale on a commercial basis through available markets.

2. Section 32.6(a) would be amended by adding a new subparagraph (12), to read as follows:

§ 32.6 Persons eligible.

(a) Under this part the following persons are entitled to care and treatment by the Service as hereinafter prescribed:

(12) Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations.

3. A new center heading and a new § 32.57 would be added, to read as follows:

OWNER-OPERATORS OF COMMERCIAL FISHING VESSELS

§ 32.57 Conditions and extent of treatment.

Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations shall be entitled to care and treatment by the Service under the same conditions, where applicable, and to the same extent as is provided for American seamen.

(Sec. 215, 56 Stat. 690, as amended; 42 U.S.C. 216. Interpret or apply sec. 322, 56 Stat. 696, as amended by 78 Stat. 398; 42 U.S.C. 349)

Dated: October 21, 1964.

[SEAL]

LUTHER L. TERRY,
Surgeon General

Approved: November 3, 1964.

ANTHONY J. CELEBREZZE,
Secretary.



Department of the Interior

BUREAU OF COMMERCIAL FISHERIES

FISHING VESSEL CONSTRUCTION SUBSIDY REGULATIONS ADOPTED:

Regulations governing the payment of subsidies under the United States Fishing Fleet Improvement Act (P. L. 88-498) have been adopted as a revision of Part 256, Subchapter F, Chapter II, Title 50, Code of Federal Regulations, and published in the Federal Register of December 2, 1964, and were to become effective December 22, 1964. Rules and regulations governing the Notice and Hearing provisions of the Act were adopted as Part 257 of the above Subchapter and published in the Federal Register of December 11, 1964, and were to become effective December 31, 1964.

Part 256 of the regulations says a commercial fisherman can, under certain conditions, be reimbursed by the U. S. Government for the difference between the cost of building a vessel in U. S. shipyards and in less expensive foreign shipyards. The amount of reimbursement cannot exceed one-half of the U. S. cost.

FISHING VESSEL

CONSTRUCTION

DIFFERENTIAL

SUBSIDY



UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Branch of Loans and Grants
Washington, D. C. 20240

Eligibility for the subsidy is restricted to vessels of advanced design, capable of fishing in expanded areas (fishing grounds not usually fished by the majority of vessels working in a particular fishery), equipped with newly developed gear, and scheduled for operation in a fishery where such use will not cause economic hardship to other operators in that fishery. ("Newly developed gear" is defined as the most modern gear available that is suitable for use in the fishery for which the proposed vessel is designed.)

The regulations provide for hearings on each contract under the new law. Such hearings will allow any person who feels he will be economically injured by the construction of the proposed vessel an opportunity to present evidence of potential economic losses.

The United States Fishing Fleet Improvement Act authorized the appropriation of \$10 million annually for the construction subsidy program. Congress has appropriated \$2½ million to start the program during the current fiscal year (ending June 30, 1965).

Information regarding the program and application forms may be obtained from the Branch of Loans and Grants, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240; or from any of the Bureau's Regional Offices.

Following are the revised Fishing Vessel Construction Differential Subsidy Procedures (50 CFR Part 256 and Part 257) as published in the Federal Register, December 2 and 11, 1964:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER F—AID TO FISHERIES

PART 256—FISHING VESSEL CON- STRUCTION DIFFERENTIAL SUBSIDY PROCEDURES

On page 13902 of the FEDERAL REGISTER of October 8, 1964, there was published a notice and text of a proposed revision of Part 256. The purpose of the revision is to incorporate those changes necessitated by the enactment of the United States Fishing Fleet Improvement Act (P.L. 88-498) which was approved August 30, 1964. Due to the numerous changes being proposed, the procedures will be more readily understood if the entire part is published in revised form.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed revision. Several comments and suggestions were received and all have been considered. The proposed revision is hereby adopted so as to include applicable suggested changes.

These regulations shall become effective at the beginning of the 20th calendar day following the date of publication in the *FEDERAL REGISTER*.

Part 256 is revised to read as follows:

- Sec.**
 256.1 Basis and purpose.
 256.2 Definitions.
 256.3 Eligibility requirements.
 256.4 Applications.
 256.5 Notice and hearing.
 256.6 Subsidy contract.
 256.7 Vessel operations.
 256.8 Penalties.
 256.9 Inspection of vessels.
 256.10 Payment of subsidy.

AUTHORITY: The provisions of this Part 256 issued under sec. 10, Public Law 86-516, as amended.

§ 256.1 Basis and purpose.

(a) The Act of June 12, 1960 (Public Law 86-516), as amended and herein-after referred to as the Act, authorizes the Secretary of the Interior to pay a subsidy for the construction of fishing vessels in shipyards of the United States.

(b) The purpose of this part is to prescribe rules and regulations governing the payment of these subsidies.

§ 256.2 Definitions.

(a) Secretary. The Secretary of the Interior or his authorized representative.

(b) Administrator. The Maritime Administrator in the Department of Commerce or his authorized representative.

(c) Director. The Director, Bureau of Commercial Fisheries, Department of the Interior, or his authorized representative.

(d) Person. Individual, association, partnership or corporation, or any one or all as the context requires.

(e) Fishery. A segment of the commercial fishing industry engaged in the catching of a single species or a group of species of fish and shellfish. Any other species taken must be caught incidentally while fishing for and using gear designed for the capture of the species comprising the fishery.

(f) Expanded area. Fishing grounds not usually fished by the majority of the vessels operating in the fishery for which the proposed vessel is designed.

(g) Newly developed gear. The most modern gear available that is suitable for use in the fishery for which the proposed vessel is designed.

§ 256.3 Eligibility requirements.

(a) Vessel will be of advance design: In order to be considered to be of advance design, the vessel must be designed to have significant advantages in utility and efficiency over a significant number of vessels engaged in the fishery in which the proposed vessel is designed to operate.

(b) No economic hardship to efficient vessel operators: The determination that operation of a proposed vessel will not cause economic hardship to efficient

vessel operators already operating in that fishery shall be made by the Secretary after notice and hearing, taking into consideration the condition of the resource, the efficiency of the vessels and gear being operated in that fishery compared with the proposed vessel, the prospects of the market for the species caught, and the degree and duration of any anticipated economic hardship.

(c) Aid in the development of the United States fisheries: For the vessel to aid in the development of the United States fisheries under conditions that the Secretary considers to be in the public interest, the vessel must be a modern vessel which will upgrade the fleet. Special consideration will be given to vessels which will provide a significant contribution in helping the domestic fishery meet foreign competition.

(d) The applicant possesses the ability, experience, resources and other qualifications necessary to enable him to operate and maintain the proposed new fishing vessel. In making this determination, the Secretary will inquire into the economic feasibility of the fishing venture and will require reasonable assurance that the applicant can operate the vessel profitably.

§ 256.4 Applications.

Applications for a subsidy shall be made on forms prescribed by the Secretary and shall be filed with the Director, Bureau of Commercial Fisheries, Washington, D.C. The applications must be accompanied by three copies of the cross section, deck arrangement, outboard profile, and specifications of the proposed vessel. The Secretary may require such additional complete detailed construction plans as may be necessary after a review of the application and accompanying plans and specifications.

§ 256.5 Notice and hearing.

After receipt of an application eligible on its face for a construction differential subsidy the Director will publish a Notice of Hearing on a Subsidy Application in the *FEDERAL REGISTER* and hold hearings in accordance therewith. The purpose of the hearing will be to provide any person who feels he will be economically injured by the construction of the proposed vessel to cross-examine witnesses and/or present evidence that the operation of such vessel will cause economic hardship to efficient vessel operators already operating in the fishery for which the vessel is designed. Hearing procedures will be held in accordance with Part 257 of this subchapter.

§ 256.6 Subsidy contract.

(a) A contract for the payment of the subsidy will take effect when all contracts for the construction of such vessel, have been approved by the Administrator and the subsidy contract has been signed by the Secretary and the applicant; and

(b) The contract shall contain a finding of the useful life of the vessel as determined by the Secretary to be used in computing the amount of the total depreciated construction subsidy to be repaid to the Secretary in accordance with section 9 of the Act.

§ 256.7 Vessel operations.

(a) If the owner of a fishing vessel constructed with the aid of a subsidy desires to operate it in a different fishery

than the one for which it was designed because of an actual decline in that particular fishery, he shall submit an application to the Secretary for permission to transfer the operations of the vessel to a different fishery. The application shall contain data showing the decline in the fishery for which the vessel was designed, how this decline is making the operation of the vessel uneconomical or less economical, and why the transfer will not cause economic hardship or injury to efficient vessel operators already operating in the fishery to which he wishes to transfer operations.

(b) Upon receipt of such an application the Secretary will publish a Notice of Hearing on an Application to Change Fishery in the *FEDERAL REGISTER* and hold hearings in accordance therewith. The purpose of the hearings will be to provide any person who feels he will be economically injured by said transfer of fishing operations an opportunity to cross-examine witnesses and/or present evidence that such a transfer of operations will cause economic hardship or injury to efficient vessel operators already operating in the fishery to which the vessel's operations would be transferred. Hearing procedures will be held in accordance with Part 257 of this subchapter.

§ 256.8 Penalties.

In case the Secretary shall find that a vessel has operated contrary to the provisions of the Act or of regulations issued thereunder, he shall immediately notify the owner in writing of the specific acts involved and the amount of the penalty. The vessel owner may appeal such a finding to the Secretary in writing within 30 days of the date of mailing such finding to the last known address of the vessel owner. The amount of penalty assessed in any one year shall be equal to the total subsidy paid multiplied by the ratio that one year bears to the total number of years determined by the Secretary, as the useful life of the vessel: *Provided, however, That if the amount is not paid within 60 days after receipt of notice then the amount due shall be the total amount of the subsidy paid depreciated to the beginning of the year in which the vessel operated unlawfully. Any amount due hereunder shall constitute a maritime lien against the vessel effective at the time the Secretary determines that the vessel has operated in violation of the Act or regulations.*

§ 256.9 Inspection of vessels.

The Secretary or the Administrator shall have access at all times to all vessels which are being constructed under a contract providing for a construction subsidy provided for by the Act.

§ 256.10 Payment of subsidy.

Subsidy payments will be paid in accordance with the terms of the subsidy contract. No subsidy payments shall be made until the entire amount of the applicant's share of the subsidized construction cost has been paid. If the amount of subsidy exceeds 30 percent of the subsidized construction cost, an amount equal to at least 30 percent of the subsidized construction cost shall be withheld until (a) the Maritime Administrator has certified that the vessel has been completed in accordance with the approved plans and specifications, and (b) all amounts due by the applicant

on account of the construction of the vessel, including designing, equipping, and outfitting costs, have been paid. Any interim subsidy payments due pursuant to the subsidy contract shall be paid only after the Secretary has determined that such amount is properly due. If the amount of subsidy does not exceed 30 percent of the subsidized construction cost, none of the subsidy shall be paid until (a) the Maritime Administrator has certified that the vessel has been completed in accordance with the approved plans and specifications, and (b) all amounts due by the applicant on account of the construction of the vessel, including designing, equipping, and outfitting costs, have been paid. Subsidy payments may be made to the applicant or jointly to the applicant and construction contractor or others, as may be appropriate, pursuant to the terms of the construction contract or otherwise.

STEWART L. UDALL,
Secretary of the Interior.

NOVEMBER 25, 1964.

PART 257—NOTICE AND HEARING ON SUBSIDIES

On pages 14744 to 14746 of the FEDERAL REGISTER of October 29, 1964, there was published a notice of proposed rule making to issue regulations governing the procedures for the notice and hearing requirements of the United States Fishing Fleet Improvement Act (Public Law 88-498). Interested persons were given 30 days in which to submit written comments, suggestions, or objections with respect to the proposed regulations.

No objections have been received and the only suggestion submitted does not require a revision of the proposal.

The proposed regulations are hereby adopted without change and are set forth below. This part shall become effective at the beginning of the 20th calendar day following the date of this publication in the FEDERAL REGISTER.

STEWART L. UDALL,
Secretary of the Interior.

DECEMBER 8, 1964.

- Sec.
- 257.1 Basis and purpose.
 - 257.2 Definitions.
 - 257.3 Scope of rules.
 - 257.4 Mailing address.
 - 257.5 Authentication.
 - 257.6 Inspection of records.
 - 257.7 Appearance and practice.
 - 257.8 Parties.
 - 257.9 Form, execution and service of documents.
 - 257.10 Notice, pleadings and replies.
 - 257.11 Duties of Presiding Officer.
 - 257.12 Hearing procedure.
 - 257.13 Evidence.
 - 257.14 The record.
 - 257.15 Decisions.

AUTHORITY: The provisions of this Part 257 issued under the Act of June 12, 1960 (Public Law 86-516), as amended.

§ 257.1 Basis and purpose.

(a) The Act of June 12, 1960 (Public Law 86-516), as amended by the United States Fishing Fleet Improvement Act (Public Law 88-498) authorizes the Secretary of the Interior to pay a subsidy for the construction of fishing vessels in shipyards of the United States and requires that this be done only after Notice and Hearing.

(b) The purpose of this part is to establish rules of practice and procedure for the notice and hearing.

§ 257.2 Definitions.

Definitions shall be the same as in Part 256 of this subchapter.

§ 257.3 Scope of rules.

The regulations in this part govern the procedure in hearings subject to Part 256 of this subchapter. These hearings are subject to the Administrative Procedure Act (5 U.S.C. 1003, et seq.) and Practice Before The Department of the Interior (43 CFR Part 1). The regulations shall be construed to secure the just, speedy, and inexpensive determination of every proceeding with full protection for the rights of all parties therein.

§ 257.4 Mailing address.

Documents required to be filed in, and correspondence relating to, proceedings governed by the regulations in this part shall be addressed to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C., 20240.

§ 257.5 Authentication.

All rules, orders, determinations, and decisions of the Secretary shall be signed by the Secretary.

§ 257.6 Inspection of records.

The files and records of these hearings, except those held by the Secretary for good/cause to be confidential, shall be open to inspection and copying as follows:

(a) All pleadings, motions, depositions, correspondence, exhibits, transcripts of testimony, exceptions, briefs, and decisions in any formal proceeding under this part may be inspected and copied in the office of the Chief, Branch of Loans and Grants, Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C., 20240.

§ 257.7 Appearance and practice.

(a) A party may appear in person or by an officer, partner or regular employee of the party; by or with counsel or as otherwise permitted by 43 CFR Part 1 in any proceeding under the regulations in this part. A party may offer testimony, produce and examine witnesses, and be heard upon brief and at oral argument if oral argument is granted by the Presiding Officer. Attorneys-at-law who are admitted to practice before the Federal Courts or before the courts of any State or possession of the United States, may represent a party as counsel.

(b) Persons who appear at any hearing shall deliver a written notice of appearance to the official reporter, stating for whom the appearance is being made. The Presiding Officer may require a person making an appearance in a representative capacity to show his authority to act in such capacity. The written appearance shall be made a part of the record.

§ 257.8 Parties.

(a) The term "party" shall include any natural person, corporation, association, firm, partnership, trustee, receiver, cooperative or governmental agency determined by the Presiding Officer as having an interest in the proceedings. A party making an application shall be

designated as "applicant." A party whose petition for leave to intervene is granted shall be designated an "intervenor." Only a party as designated in this section may introduce evidence or examine witnesses at hearings.

(b) For an intervenor to prove an interest in the hearings he must show that there is a reason for belief that the operation of the vessel described in the application will cause economic injury or hardship to efficient vessel operators already operating in the fishery in which it is proposed that the vessel be operated.

§ 257.9 Form, execution and service of documents.

(a) All papers to be filed under the regulations in this part shall be clear and legible; and shall be dated, signed in ink, contain the docket description and title of the proceeding and the title, if any, and the address of the signatory. Five copies of all papers are required to be filed. Documents filed shall be executed by (1) the person or persons filing same, (2) by an authorized officer thereof if it be a corporation or, (3) by an attorney or other person having authority with respect thereto.

(b) All documents, when filed, shall show that service has been made upon all parties to the proceeding. Such service shall be made by delivering one copy to each party in person or by mailing by first class mail, properly addressed with postage prepaid. When a party has appeared by attorney or other representative, service on such attorney or other representative will be deemed service upon the party. The date of service of document shall be the day when the matter served is deposited in the United States mail, shown by the postmark thereon, or is delivered in person, as the case may be.

(c) The original of every document filed under this part and required to be served upon all parties to a proceeding shall be accompanied by a certificate of service signed by the party making service, stating that such service has been made upon each party to the proceeding. Certificates of service may be in substantially the following form:

I hereby certify that I have this day served the foregoing document upon all parties of record in this proceeding by: (1) Mailing postage prepaid, (2) delivering in person, a copy to each party.

Dated at _____ this _____ day of _____ 19____.

Signature _____

§ 257.10 Notice, pleadings and replies.

(a) After acceptance of an application eligible on its face for construction subsidy or for the transfer of a vessel to a different fishery, the Director, Bureau of Commercial Fisheries, shall publish a notice of hearing in the FEDERAL REGISTER advising that a hearing will be held not less than 30 days after date of such publication and setting the time and place and providing details with respect to such hearing. Any person desiring to intervene and present evidence that the approval of the application will cause economic injury or hardship to efficient vessel operators must file, at least 10 days prior to the date set for the hearing (unless otherwise consented to by the Presiding Officer), a Petition of Intervention setting forth his interest. The hearing will be held in Washington, D.C.,

unless such a petition is received. If such a petition is received, the Presiding Officer may designate a different hearing site by telegraphic notice to the parties in the proceedings. If no petition to intervene is received, it will not be necessary for the applicant to appear at the hearing if he files all information in writing as required by the Presiding Officer.

(b) All petitions shall be in writing and shall state the petitioner's grounds of interest in the subject matter; the facts relied upon, the relief sought; and shall cite the authority upon which the petition rests. The petition shall be served upon all parties named therein or affected thereby. Answers to petitions must be filed within 5 days of the hearing date, unless otherwise consented to by the Presiding Officer.

(c) Amendments or supplements to pleadings may be allowed or refused in the discretion of the Presiding Officer. The Presiding Officer may direct a party to state its case more fully and in more detail by way of amendment. If a response to an amended pleading is necessary, it may be filed and served within the time set by the Presiding Officer. Amendments or supplements allowed prior to hearing will be served in the same manner as the original pleading.

(d) All motions and requests for rulings shall state the relief sought, the authority relied upon and the facts alleged. If made before or after the hearing, such motions shall be in writing. If made at the hearing, motions may be stated orally: *Provided, however*, that the Presiding Officer may require such motion to be reduced to writing and filed and served in the same manner as a formal motion. Oral argument upon a written motion, in which an answer has been filed, may be granted within the discretion of the Presiding Officer. Answers to a formal motion or pleading shall be filed and served in the same manner as the motion or pleading.

§ 257.11 Duties of Presiding Officer.

The Presiding Officer shall have the authority and duty to:

- (a) Take or cause depositions to be taken.
- (b) Rule upon proposed amendments or supplements to motions and pleadings.
- (c) Regulate the course of the hearings.
- (d) Prescribe the order in which evidence shall be presented.
- (e) Dispose of procedural requests or similar matters.
- (f) Hear and initially rule upon all motions and petitions before him.
- (g) Administer oaths and affirmations.
- (h) Examine witnesses.
- (i) Rule upon offers of proof and receive competent, relevant, material, reliable, and probative evidence.
- (j) Exclude irrelevant, immaterial, incompetent, unreliable, repetitious or cumulative evidence.
- (k) Exclude cross-examination which is primarily intended to elicit self-serving declarations in favor of the witness.
- (l) Limit cross-examination to interrogatories which are required for a full and true disclosure of the facts in issue.
- (m) Act upon petitions to intervene.
- (n) Act upon submissions of facts or arguments.
- (o) Hear arguments at the close of testimony.

(p) Fix the time for filing briefs, motions and other documents to be filed in connection with hearings.

(q) Issue the initial decisions and dispose of any other pertinent matter that normally and properly arises in the course of proceedings.

§ 257.12 Hearing procedure.

(a) Unless authorized by the Presiding Officer, witnesses will not be permitted to read prepared testimony into the record. The evidentiary record shall be limited to factual and expert opinion testimony. Arguments will not be received in evidence but should be presented in opening and/or closing statements or in briefs to the Presiding Officer. All exhibits and responses to requests for evidence shall be numbered consecutively by the party submitting same and shall be filed with the Presiding Officer if filed during the hearing. If filed at some other time they should be filed in accordance with § 257.4 with one copy also being sent to each party to the hearing.

(b) Normally, the order of presentation at the hearing will be alphabetical in each of the following categories:

- (1) Applicant.
- (2) Intervenor.

Rebuttal should be presented without any adjournment in the proceedings.

(c) Cross-examination shall be limited, subject to § 257.13(b), to the scope of the direct examination and to witnesses whose testimony is adverse to the party desiring to cross-examine. Only cross-examination which is necessary to test the truth and completeness of the direct testimony and exhibits will be permitted.

(d) A request for oral argument at the close of testimony will be granted or denied by the Presiding Officer in his discretion.

(e) Rulings of the Presiding Officer may not be appealed prior to, or during, the course of the hearings, except in extraordinary circumstances where prompt decision by the Secretary is necessary to prevent unusual delay or expense, in which instance the matter shall be referred forthwith to the Secretary by the Presiding Officer. Any appeal shall be filed within 10 days from the date of the close of the hearing.

§ 257.13 Evidence.

(a) In any proceedings under this part, all evidence which is relevant, material, reliable and probative, and not unduly repetitious or cumulative, shall be admissible. Irrelevant and immaterial or unduly repetitious evidence shall be excluded.

(b) Each party shall have the right to present his case or defense by oral or documentary evidence, to submit rebuttal evidence; and to conduct such cross-examination as may be required for a full and true disclosure of the facts.

(c) At any time during the hearing the Presiding Officer may call for the production of further relevant and material evidence, reports, studies and analyses upon any issue, and require such evidence to be presented by the party or parties concerned, either at the hearing or adjournment thereof. Such material shall be received subject to appropriate motions, cross-examination and/or rebuttal. If a witness refuses to testify or produce the evidence as requested, the Presiding Officer shall forthwith report such refusal to the Secretary.

§ 257.14 The record.

(a) The Director, Bureau of Commercial Fisheries, will designate an official reporter for all hearings. The official transcript of testimony taken, together with any exhibits and briefs filed therewith, shall be filed with the Director, Bureau of Commercial Fisheries. Transcripts of testimony will be available in any proceeding under the regulations of this part, and will be supplied by the official reporter to the parties and to the public, except when required for good cause to be held confidential, at rates fixed by the contract between the United States of America and the reporter. If the reporter is an employee of the Department of the Interior, the rate will be fixed by the Director, Bureau of Commercial Fisheries.

(b) The transcript of testimony and exhibits, together with all papers and requests, including rulings and the initial decision filed in the proceeding, shall constitute the exclusive record for decision. The initial decision will be predicated on this same record, as will the final decision.

§ 257.15 Decisions.

(a) The Presiding Officer is delegated the authority to render initial decisions in all proceedings before him. The same officer who presides at the reception of evidence shall render the initial decision except when such officer becomes unavailable to the Department of the Interior. In such case, another Presiding Officer will be designated by the Secretary to render the initial decision. Briefs, or other documents, to be submitted after the hearing must be received not later than ten (10) days after the hearing unless otherwise extended by the Presiding Officer upon motion by a party. The initial decision shall be made within twenty (20) days after the hearing or the receipt of all briefs, whichever is later. If no appeals from the initial decision are received within ten (10) days of the date of the initial decision, it will become the final decision on the twentieth day following the date of the initial decision. If an appeal is received, the appeal will be transmitted to the Secretary who will render the final decision after considering the record and the appeal.

(b) All initial and final decisions, shall include a statement of findings and conclusions, as well as the reasons or basis therefor, upon the material issues presented. A copy of each decision shall be served on the parties to the proceeding, and furnished to interested persons upon request.

(c) Official notice may be taken of such matters as might be judicially noticed by the courts; or of technical or scientific facts within the general or specialized knowledge of the Department of the Interior as an expert body; or of a document required to be filed with or published by a duly constituted Government body: *Provided*, That where a decision or part thereof rests on the official notice of a material fact not appearing in the evidence of the record, the fact of official notice shall be so stated in the decision and any party, on timely request, shall be afforded an opportunity to show the contrary.

* * * * *

BUREAU OF INDIAN AFFAIRS

CHANGE PROPOSED IN INDIAN
COMMERCIAL FISHING REGULATIONS IN
ALASKAN ANNETTE ISLANDS RESERVE:

Indian commercial fishing in the Annette Islands Reserve of southeastern Alaska was the subject of a "Notice of Proposed Rule Making" published in the Federal Register, November 28, 1964, by the U. S. Department of the Interior. The Secretary of the Interior proposes to amend Title 25 Code of Federal Regulations Part 88 (Indian Fishing in Alaska), Sec. 88.3 and Sec. 88.6. The proposed amendment to Sec. 88.3 concerns closed waters. The proposed amendment to Sec. 88.6 concerns enforcement and fish traps. Following are the proposed amendments as published in the Federal Register, November 28, 1964:

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[25 CFR Part 88]

INDIAN FISHING IN ALASKA

Notice of Proposed Rule Making

Basis and purpose. Notice is hereby given that pursuant to the obligation imposed upon, and the authority vested in the Secretary of the Interior by 25 U.S.C. sections 2 and 9; 5 U.S.C. section 485; section 15 of the Act of March 3, 1891 (26 Stat. 1101, 48 U.S.C. section 358); the Presidential Proclamation of April 28, 1916 (39 Stat. 1777); section 2 of the Act of May 1, 1936 (49 Stat. 1250, 48 U.S.C. section 358a); and section 4 of the Act of July 7, 1958 (72 Stat. 339), as amended (73 Stat. 141), it is proposed to amend Part 88 of Title 25, Code of Federal Regulations by adding paragraph (f) to § 88.3 and revising paragraph (b) of § 88.6 as set forth below. The purpose of the amendment is to regulate and govern Indian commercial fishing in Alaska.

It is the policy of the Department of the Interior wherever practicable to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendment to the Bureau of Indian Affairs, Washington, D.C., 20240, within thirty days of the date of publication of this notice in the *Federal Register*.

1. Section 88.3 is amended by the addition of a new subparagraph (f) to read as follows:

§ 88.3 Commercial fishing, Annette Islands Reserve.

(f) Closed waters; commercial salmon fishing is prohibited at all times in the following areas:

(1) Tamgas Harbor north of the latitude of Deer Point.

(2) Streams and rivers of Annette Island and within 500 yards of the terminus, as defined herein, of any salmon stream or within such greater or lesser

distances from such terminus as may be specified in regulations having particular application to designated streams or areas. For the purpose of the regulations, the word "terminus" shall mean a line drawn between seaward extremities of the exposed tideland banks of any salmon stream at mean low tide. The facts as to the location of any such line may be ascertained from time to time by the Secretary of the Interior or such other persons he may designate. In accordance therewith the mouth of such creek, stream, or river shall be appropriately marked.

2. Section 88.6(b) is amended to read as follows:

§ 88.6 Enforcement; violation of regulations; corrective action; penalties; closure of restrictions, Annette Island Reserve.

(b) Whenever any duly authorized enforcement representative of the Secretary of the Interior has evidence that any violation of the regulations of this part relating to fish traps has occurred, he shall direct immediate closure of the trap involved and shall affix an appropriate seal thereto to prevent further fishing. The matter shall be reported without delay to the Area Director, Bureau of Indian Affairs, who shall thereupon report and recommend to the Secretary of the Interior appropriate corrective action.

JOHN A. CARVER, Jr.,

Assistant Secretary of the Interior.

NOVEMBER 23, 1964.



Department of the Treasury

COAST GUARD

NEW INTERNATIONAL REGULATIONS
FOR PREVENTING COLLISIONS AT SEA:

The International Regulations for Preventing Collisions at Sea, 1960 (commonly called the 1960 International Rules of the Road), will become effective on September 1, 1965, replacing the 1948 International Rules of the Road which are now in effect. The new International Rules will not be effective, however, on United States waters governed by Inland, Great Lakes, or Western Rivers Rules of the Road. The new regulations were issued by the U. S. Coast Guard on September 1, 1964.

The revised rules were formulated by the maritime nations making up the Inter-Governmental Maritime Consultative Organization (IMCO), of which the United States is a member.

The pending 1960 International Rules of the Road make a number of changes, the most

significant of which concerns conduct in restricted visibility. Several important questions having to do with a vessel navigating with the aid of radar are resolved by the new Rules. Some of the new regulations are of interest and apply to fishing vessels.

In the United States, Congress through the Act of September 24, 1963 (P. L. 88-131),

authorized the President to proclaim the revised International Rules of the Road on or after the effective date announced by IMCO which is September 1, 1965. The revised Rules will apply to all public and private vessels and aircraft of United States registry covered by the legislation.

Note: Copies of the International Regulations for Preventing Collisions at Sea, 1960, are available from local Coast Guard Offices or from the U. S. Coast Guard, Washington, D. C.



TROUT FISHERY COOPERATIVE IN A DESERT

In one of the hottest, driest, and most savage deserts in the world, church workers are helping to build a fishery cooperative which aims at producing 100,000 rainbow trout a year. These will add badly needed protein to the diet of a depressed community and help to raise the people's standard of living.

The ponds where the trout are being raised are part of a cleft in an immense wasteland of rock-salt and volcanic ash at the foot of the Andes Mountains, Chile. Copper, iron, and other minerals are being mined on the flanks of those mountains.

It is a lunar landscape--fantastic, barren and menacing--and lit by a sunshine that is blinding and scorching. There is no rain. There are a few small, green oases where the presence of fresh water has enabled trees to grow and some sparse crops of maize, beans, and alfalfa to be raised.

The town of Calama, at an altitude of 7,400 feet, is the largest of the oases and is the capital of a territory as large as Switzerland.

But it is quite unable to feed itself. Within five years another 10,000 to 12,000 inhabitants have been added to Calama's population. Most of them live in shacks from cardboard, pieces of wood, sacking, and sheets of rusty tin. These shacks form 23 slum districts around the town.

Such a setting would seem to offer the fisherman no chance to pursue his profession, and an Argentinian agronomist and veterinarian was astonished, soon after he arrived in Calama, to meet two men walking across the desert carrying a 14-pound rainbow trout.

Recruited by the World Council of Churches to take part in a £36,000 (US\$100,000) community development project to help the churches deal with Calama's social situation, the Argentinian learned that the two men were, in fact, benefiting from the enthusiasm of an executive at the copper mine who had stocked a stream with trout but had then been recalled to the United States.

The trout had bred and multiplied.

The stream, springing out of the salt desert, provided exactly the right kind of water for trout to thrive in. Guided by the agronomist, 18 fishermen formed a cooperative and by March 1964 had made and stocked six ponds.

They plan to increase these to 100 by the end of the year. Each pond will contain 1,000 trout which the cooperative will sell in Calama at one-quarter the price of meat. (The Fishing News, June 26, 1964.)



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
WHL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|--|
| CFS-3247 | - Shrimp Landings, 1962 Annual Summary (Revised), 43 pp. |
| CFS-3563 | - Gulf Coast Shrimp Data, January 1964, 17 pp. |
| CFS-3566 | - Gulf Coast Shrimp Data, March 1964, 17 pp. |
| CFS-3583 | - Texas Landings, March 1964, 2 pp. |
| CFS-3584 | - Shrimp Landings, April 1964, 5 pp. |
| CFS-3586 | - Gulf Coast Shrimp Data, April 1964, 19 pp. |
| CFS-3589 | - Texas Landings, April 1964, 2 pp. |
| CFS-3590 | - New England Fisheries, 1963 Annual Summary, 10 pp. |
| CFS-3604 | - Texas Landings, May 1964, 2 pp. |
| CFS-3607 | - Virginia Landings, June 1964, 4 pp. |
| CFS-3613 | - Alabama Landings, April 1964, 3 pp. |
| CFS-3614 | - Alabama Landings, May 1964, 3 pp. |
| CFS-3617 | - Texas Landings, June 1964, 2 pp. |
| CFS-3618 | - Maryland Landings, July 1964, 4 pp. |
| CFS-3621 | - Georgia Landings, May 1964, 3 pp. |
| CFS-3622 | - Georgia Landings, June 1964, 3 pp. |
| CFS-3623 | - Georgia Landings, July 1964, 3 pp. |
| CFS-3625 | - Texas Landings, July 1964, 2 pp. |
| CFS-3626 | - New York Landings, July 1964, 5 pp. |
| CFS-3628 | - South Carolina Landings, March 1964, 2 pp. |
| CFS-3629 | - South Carolina Landings, April 1964, 2 pp. |
| CFS-3630 | - South Carolina Landings, May 1964, 2 pp. |
| CFS-3631 | - South Carolina Landings, June 1964, 3 pp. |
| CFS-3632 | - South Carolina Landings, July 1964, 3 pp. |
| CFS-3634 | - Florida Landings, July 1964, 8 pp. |
| CFS-3635 | - Louisiana Landings, July 1964, 3 pp. |
| CFS-3636 | - Shrimp Landings, June 1964, 5 pp. |
| CFS-3637 | - Gulf Coast Shrimp Data, June 1964, 25 pp. |
| CFS-3638 | - Maine Landings, July 1964, 4 pp. |
| CFS-3639 | - North Carolina Landings, August 1964, 4 pp. |
| CFS-3641 | - Rhode Island Landings, May 1964, 3 pp. |
| CFS-3642 | - Georgia Landings, August 1964, 3 pp. |
| CFS-3643 | - South Carolina Landings, August 1964, 3 pp. |
| CFS-3644 | - Maryland Landings, August 1964, 4 pp. |

- CFS-3645 - New Jersey Landings, July 1964, 3 pp.
CFS-3647 - Florida Landings, August 1964, 8 pp.
CFS-3649 - Fish Meal and Oil, August 1964, 2 pp.
CFS-3656 - Shrimp Landings, July 1964, 5 pp.

Sep. No. 714 - Soviet Far East Fisheries Expansion.

Sep. No. 715 - Overall View of Soviet Fisheries in 1963, with Emphasis on Activities off United States Coasts.

Sep. No. 716 - Supply, Sustained Yield, and Management of the Maine Lobster Resource.

Sep. No. 717 - Trawling Results of the R/V Anton Bruun in the Bay of Bengal and Arabian Sea.

Sep. No. 718 - Crab Industry of Chesapeake Bay and the South--An Industry in Transition.

Sep. No. 719 - Review of the Movement of Albacore Tuna Off the Pacific Coast in 1963.

Sep. No. 720 - (Salmon) Abernathy Spawning Channel Proves Effective for Reproduction of Chum Salmon.

Sep. No. 721 - Design and Operation of a Tray Rack for the Study of Oysters.

FL-46 - Dealers in Trout and Pondfishes, 77 pp., revised September 1964.

FL-190 - Turtle Trapping, 8 pp., illus., revised May 1964.

FL-411 - Care of Tropical Aquarium Fishes, 4 pp., revised May 1964.

FL-560 - Author Index of Publications, Addresses, and Translations - 1962, Bureau of Commercial Fisheries, Branches of Economics and Technology, by F. Bruce Sanford, Kathryn L. Osterhaug, and Helen E. Plastino, 10 pp., April 1964.

FL-563 - Pacific Salmon, by Clifford J. Burner, 12 pp., illus., September 1964. Discusses the five species of Pacific salmon--Oncorhynchus gorbuscha, O. tshawytscha, O. nerka, O. kisutch, and O. keta; general life history; food; migration; commercial importance; water problems; and research on salmon. Included are statistical tables showing data for 5 species of Pacific salmon occurring on the west coast of North America; commercial catch of salmon in Pacific Coast States, 1950-60; and value of commercial catch of salmon in Pacific Coast States, 1950-60.

FL-569 - The True Pikes, by Ernest G. Karvelis, 11 pp., illus., September 1964. Discusses scientific names of pikes, their common names, physical characteristics, occurrence, artificial propagation, and key to identification. Also describes in detail the characteristics of the muskellunge, northern pike, chain pickerel, grass pickerel, and redfin pickerel.

FL-573 - Graduate Educational Grants in Aquatic Sciences for the Academic Year 1965-66, 4 pp., illus., October 1964.

SSR-Fish, No. 467 - Annual Fish Passage Report - Rock Island Dam, Columbia River, Washington, 1962, by Paul D. Zimmer and John H. Broughton, 29 pp., illus., August 1964.

SSR-Fish, No. 468 - Statistical Records and Computations on Red Salmon (*Oncorhynchus nerka*) Runs in the Nushagak District, Bristol Bay, Alaska, 1946-59, by Ole A. Mathisen, Robert L. Burgner, and Ted S. Y. Koo, 34 pp., illus., June 1963.

SSR-Fish, No. 479 - Age and Size Composition of the 1960 Menhaden Catch Along the U. S. Atlantic Coast, with a Brief Review of the Commercial Fishery, by William R. Nicholson and Joseph R. Higham, Jr., 44 pp., illus., August 1964.

SSR-Fish, No. 484 - Field Techniques for Staining-Recapture Experiments with Commercial Shrimp, by T. J. Costello, 15 pp., illus., August 1964.

SSR-Fish, No. 485 - Disappearance of Dead Pink Salmon Eggs and Larvae from Sashin Creek, Baranof Island, Alaska, by William J. McNeil, Ralph A. Wells, and David C. Brickell, 15 pp., illus., August 1964.

Annual Report of the Bureau of Commercial Fisheries Technological Laboratory, Seattle, Washington, Calendar Year 1962, by Patricia S. Terao, Circular 180, 15 pp., illus., September 1964. The Technological Laboratory of the Pacific Region, Bureau of Commercial Fisheries, one of six such laboratories, began its research activities on May 2, 1933. The laboratory carries out research on the preservation and utilization of fish and shellfish, the chemical properties of constituents, and the application of research findings to new and improved fishery products. By preparing technical bulletins and answering inquiries, the laboratory also provides the fishing industry and the general public with information on fishery products. Currently three major research programs are under way. The first program aims at widening markets for fish oils, and consists of organic chemical investigations of the properties and reactions of fish oils, of their derivatives, and of industrial evaluation of potential uses for these products. The second, in cooperation with the Atomic Energy Commission, concerns the irradiation pasteurization of several species of fish as a means of extending the storage life of iced fish. The third deals with improving the quality of fresh and frozen fish by developing standards of quality. Studies under the latter program at present focus attention on grading methods for judging the quality of halibut as landed by fishing vessels. Several smaller projects include experiments on shellfish processing, investigation of species of fish not utilized, and studies on fish spoilage.

The Bureau of Commercial Fisheries Biological Laboratory, Oxford, Maryland; Programs and Perspectives, Circular 200, 52 pp., illus., October 1964. Shellfish research in the Middle Atlantic States was materially advanced in 1960 when the Bureau of Commercial Fisheries Biological Laboratory at Oxford, Md., was established on the eastern shore of Chesapeake Bay. Committed to increased understanding of shellfish biology, and with particular interest in factors influencing survival, growth, and reproduction of shellfish, the laboratory joined a group of state and university research units involved with comparable problems. This series of papers has been prepared by biologists concerned with the laboratory's activities. Included are: "A brief history of Federal shellfish investigations in Chesapeake Bay," by James B. Engle; "The Bureau of Commercial Fisheries Biological Laboratory at Oxford, present and future," by Carl J. Sindermann; "Environmental features of the laboratory site; the Tred Avon River," by Robert W. Hanks; "Natural and artificial pond culture of oysters," by William N. Shaw; "Studies of oyster microparasites," by Aaron Rosenfield; and "Progress in surf clam biological research," by Arthur S. Merrill and John R. Webster.

The Commercial Fisheries of the Gulf and South Atlantic Region and Their Needs, Circular 181, 42 pp., illus., September 1964. Discusses in detail the status of the commercial fishery resources of the Region, their utilization, and their needs. Summarizes the programs that should be continued or undertaken within the Region to strengthen the fishing industry and point the way to full utilization of the resources of the Gulf and South Atlantic waters. Many of the needs will be met by industry without assistance. Other needs will be met by cooperative industry-Government action; and still others, particularly in the field of biological research to provide the basis for resource management, must be met through Government efforts--both State and Federal. Coordination and integration of those separate activities are possible through the Gulf States Marine Fisheries Commission and the Atlantic States Marine Fisheries Commission, and their standing committees.

Fisheries of the World, by Sidney Shapiro, 17 pp., printed, (Reprinted from *Farmer's World, The Yearbook of Agriculture 1964*, U. S. Department of Agriculture, pp. 161-177.) Some experts on marine resources believe that about 90 percent of the ocean's productivity is unused and that utilization eventually can be increased at least fivefold without endangering aquatic stocks, according to the report. The global catch was 20 million metric tons in 1950 and nearly 45 million in 1962. It may reach 70 million by 1980. The report discusses types of fisheries, methods of capture, utilization of the world's catches, international trade in fishery products, United States participation in 9 international fisheries conventions, United States aid programs to foreign fisheries, oceanographic research, and the First Law of the Sea Conference in Geneva in 1958.

Improving the Quality of Whiting, by John A. Peters, Edward H. Cohen, and Enrico E. Aliberte, Circular 175, 17 pp., illus., July 1964. In any food industry, quality is a large factor in price; and price is important in profits. At present, the whiting industry is in an unfavorable economic position. This report suggests how the industry can strengthen itself by

improving handling methods both on the vessel and at the shore plant. These changes will increase not only the efficiency of operations, but also the quality of the products.

Investigations in Fish Control: 1--Laboratories and Methods for Screening Fish-Control Chemicals; 2--Preliminary Observations on the Toxicity of Antimycin A to Fish and Other Aquatic Animals, by Robert E. Lennon, Charles R. Walker, and Bernard L. Berger, Circular 185, 40 pp., illus., June 1964.

Pesticide-Wildlife Studies, 1963: A Review of Fish and Wildlife Service Investigations during the Calendar Year, Circular 199, 130 pp., September 1964.

Selected List of Fish and Wildlife Publications for Conservation Education, 5 pp. These publications are available without charge, in limited quantities, to teachers for classroom use.

Sharks of the Genus CARCHARHINUS Associated with the Tuna Fishery in the Eastern Tropical Pacific Ocean, by Susumu Kato, Circular 172, 25 pp., illus., June 1964.

"Technological investigations of pond-reared fish. Part 1--Product development from buffalofish," by Leo J. Sullivan and Harry L. Seagran, article, Fishery Industrial Research, vol. 2, no. 2, December 1963, pp. 29-42, printed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U.S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-3	Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964, 38 pp.
MNL-63	United Arab Republic Fisheries, 1963 and 1964, 6 pp.
MNL-80	Brazil's Fishing Industry, 1963, 14 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE TECHNOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FISH AND WILDLIFE SERVICE, U.S. NATIONAL MUSEUM, WASHINGTON, D.C. 20560.

Families of Fishes New to the Antarctic. Communiqué 3--Pelagic Young of Flatfish (Pisces, Bothidae) Off the Antarctic Coast, by A. P. Anriashv, Translation 21, 7 pp., processed. (Translated from the Russian, Zoologicheskij Zhurnal, vol. 39, no. 7, 1960, pp. 1056-1061.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE MARINE MAMMAL BIOLOGICAL LABORATORY, U.S. FISH AND WILDLIFE SERVICE, SAND POINT NAVAL AIR STATION, SEATTLE, WASH.

Present Status and Problems in Systematics of Pinnipeds, by K. K. Chapsky, 31 pp., processed. (Translated from the Russian, Trudy Sovetskoi Ikhtiologicheskoi Komissii, Akademii Nauk SSSR, vol. 12, 1961, pp. 138-149.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE REGIONAL OFFICE, U.S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

Tuna Fishing Charts, Part I-II--April 1961-September 1961, October 1961-March 1962, 2 vols., illus., processed, 1963. (Translated from the Japanese, Tuna Fishing, no. 2 (86), July 1962.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, July and August 1964, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, September 1964, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

Fishery and Oceanography Translations, No. 2, October 1964, 80 pp., processed. (Translation Program, Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. E., Seattle, Wash. 98102.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, September 1964, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

List of 102 Program Reports, Publications, and Proposals for Oceanographic Instrumentation (Including 74 ICO's PIEF Reports and Papers), by Julius Rockwell Jr., 12 pp., processed, February 18, 1964. (Oceanographic Instrumentation Program, Biological Laboratory, U. S. Bureau of Commercial Fisheries, Washington, D. C. 20240.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, September 1964, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fish-

ery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown). Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary-- August 1964, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) **Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October 1964**, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Fishery Statistics of the United States, 1962, by E. A.

Power and C. H. Lyles, Statistical Digest 56, 468 pp., illus., printed, 1964, \$2.25. The latest in a series of annual statistical reports on the fisheries of the United States contains data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fish and shellfish, and information on the volume and value of the production of manufactured fishery products and by-products. The 1962 commercial fisheries of the United States yielded a record catch of 5.4 billion pounds valued at \$396 million ex-vessel. The volume of the catch was 86 million pounds above the previous high set in 1956, while the value was \$23 million greater than the \$373 million received in 1958. The average price paid ex-vessel in 1960 was 7.4 cents per pound. Large catches of menhaden, herring, and miscellaneous industrial fish kept the average price per pound relatively low despite an increase in the price paid for most items. Species

taken in record volume in 1962 were bluefin tuna, menhaden, blue crab, king crab, surf clam, and yellowtail flounder. The combined United States-Canadian catch of 75.1 million pounds of Pacific halibut (landed weight) was also a new record. Continuing a trend which began in 1960, the number of fishing vessels again declined. The 1962 catch was taken by 126,333 fishermen. Louisiana again led all other states in volume with 777 million pounds, accounting for almost 15 percent of the total 1962 United States landings. Alaska again led all other states in value with \$57 million--a little more than 14 percent of the United States total. San Pedro, Calif., was the leading fishing port in 1962 with respect to both volume and value of landings--362 million pounds with an ex-vessel value of \$36 million. For the third time, the catch taken for industrial products (2.81 billion pounds) exceeded the quantity taken for human food (2.54 billion pounds). The per capita consumption of fish and shellfish in the U. S. in 1962 was 10.7 pounds (edible weight)--0.1 pound less than in 1961. Reduced landings of ocean perch and pollock were chiefly responsible for declining landings in the groundfish industry. The 124 million pounds of ocean perch taken were the lowest since 1944 and less than half the record 258 million pounds taken in 1951. The Maine sea herring fishery made a remarkable recovery in 1962; the catch was up over 100 million pounds. The southern California Pacific and jack mackerel fishery landed 139 million pounds. The record 2.3 billion pounds of menhaden taken in 1962 was 33 million pounds greater than in 1961, and the largest annual catch of a single species ever landed in the United States. Landings of Pacific salmon were 314.6 million pounds worth a record \$56.4 million ex-vessel, up 4 million pounds and \$4 million from 1961. Only 15.4 million pounds of California sardines were landed, and with the exception of 1952 and 1953, the catch was the smallest since World War I. Landings of tuna were 312.1 million pounds worth \$45.1 million, a decline of 13.6 million pounds but an increase of \$2.8 million compared with 1961. The crab catch was 234 million pounds worth nearly \$19 million--a record in both volume and value. Landings of oysters were the lowest on record, only 56 million pounds--6.3 million less than the previous year. The production of shrimp products continued to increase in 1962, yielding processors a record \$161 million. The 1962 pack of canned fishery products by 373 plants in the United States, American Samoa, and Puerto Rico was 36.8 million standard cases (1.1 billion pounds worth \$456.9 million to the packers). The production of industrial fishery products by 158 plants was worth \$75.7 million--an increase of \$1.1 million over 1961. Production of fresh and frozen packaged fish fillets and steaks totaled 171.5 million pounds worth \$59.3 million to the processors. Fish stick production reached a record 72.2 million pounds, and portions also a record 78.7 million pounds. The 1962 production of frozen fish and shellfish was 343 million pounds--24 million pounds more than in 1961. U. S. foreign trade in fishery products (imports plus exports of domestic products) was valued at a record \$511 million--\$79 million more than in the previous year.

Propagation and Distribution of Food Fishes for the Calendar Years 1961 and 1962, Statistical Digest 55, 49 pp., September 1964, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ARCTIC CHAR:

"Sapotit--home of the Arctic char," article, *Trade News*, vol. 17, no. 3, September 1964, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Depicts with photos the Eskimo summer fishery for Arctic char. They build up walls of rock across the river narrows, arranged in a manner that will lead the big, sleek Arctic char into a closed area of shallow water. Each summer the Eskimos must rebuild their stone weirs, which have been wrecked by the ice during the winter and spring, and when the walls are finished a watch is kept. When the char move upriver and into the traps the hunters, with wives and children beside them in the waist-deep water, spear the fish. The catch is stored to provide winter food for the Eskimo families and their dogs. In some regions commercial fisheries have been established during the past few years.

ARGENTINA:

"Las posibilidades de los subproductos en la Argentina" (The potential for fishery byproducts in Argentina), article, *Puntal*, vol. 11, no. 126, September 1964, pp. 2-3, 5, illus., printed in Spanish. Puntal Apartado de Correos 316, Alicante, Spain.

AUSTRALIA:

Fishing and Whaling, Australia, 1962-63, Statistical Bulletin No. 9, 24 pp., illus., processed, April 16, 1964. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the ninth of a series of annual statistical bulletins dealing with the fishing and whaling industry. Statistics relate to the year 1962-63 for general fisheries, the 1962 season for pearl-shell and trochus-shell fisheries, and the 1963 season for whaling, with comparative data for the previous four years. Exports and imports of fishery products, unmanufactured shells, and marine animal oils are shown for 1962-63 together with comparable figures for the previous two years. The bulletin is divided into four parts. Part I deals with general fisheries including those for fish, crustaceans, and molluscs (edible products). Part II includes fisheries for pearl shell and trochus shell (inedible products). Part III covers the operations of the whaling industry in Australia and Norfolk Island. Part IV shows particulars of overseas trade in the products of fishing and whaling.

Native Freshwater Fishes of Australia, by Gilbert P. Whitley, 127 pp., illus., printed, 1964, 14s. 6d. (about US\$2.05). Jacaranda Press, Brisbane, Australia.

AUSTRALIAN SALMON:

Australian Salmon, by W. B. Malcolm, Reprint 535, 4 pp., processed. (Reprinted from *Fisheries Management Seminar, 1963, Report of Proceedings*.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

BACTERIOLOGY:

"A study of the microbiological quality of haddock fillets and shucked, soft-shelled clams processed and marketed in the Greater Boston area," by J. T. R.

Nickerson and S. A. Goldblith, article, *Journal of Milk and Food Technology*, vol. 27, January 1964, pp. 7-12, printed. International Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

BALTIC SEA:

Yield of Baltic Catches in 1953-1954 as Compared with Previous Years (Wydałosc Polowow Baltyskich w Latach 1953-1954 na tle lat Ubieglych), by Stanislaw Laxczynski, OTS 61-11363, 35 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, *Prace Morskiego Instytutu Rybackiego w Gdyni*, vol. 9, 1957, pp. 705-736.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

BELGIUM:

"L'entrepôt frigorifique maritime de Zeebrugge (Belgique)" (The marine cold store at Zeebrugge (Belgium)), by P. Jauniaux, article, *Revue Generale du Froid*, vol. 41, no. 2, February 1964, pp. 117-119, illus., printed in French. Association Francaise du Froid, 29 Blvd. Saint-Germain, Paris (6^e), France.

BIOCHEMISTRY:

"Studies on the external mucous substance of fishes. VII--Quantitative analysis of the mucous-polysaccharide from some fishes. 1--Neutral sugar composition," by Noriyuki Enomoto and Yukio Tomiyasu, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, May 1962, pp. 510-513, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan.

"Volatile alkaline matter and trimethylamine in meat of various fishes caught in Azov-Black Sea basin," by G. K. Koval'chuk and N. F. Moskalenko, article, *Rybnoe Khoziaistvo*, vol. 37, no. 12, 1961, pp. 64-68, printed in Russian. Rybnoe Khoziaistvo, V. Krasnoselskaia 17, B-140, Moscow, U.S.S.R.

BRAZIL:

"Classificacao economica dos peixes do Rio Grande do Sul" (Economic classification of fishes of Rio Grande do Sul), by B. N. Barcellos, article, *Boletim Instituto Ciencia Natural da Universidade do Rio Grande do Sul*, vol. 14, 1962, pp. 5-16, printed in Portuguese. Instituto Ciencia Natural, Universidade do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil.

"Nomes comuns dos peixes da costa do Rio Grande do Sul e seus correspondentes em sistemática" (Common names of fishes of the coast of Rio Grande do Sul, and their corresponding names in systematics), by B. N. Barcellos, article, *Boletim Instituto Ciencia Natural da Universidade do Rio Grande do Sul*, vol. 13, 1962, pp. 7-20, printed in Portuguese.

BRITISH VIRGIN ISLANDS:

Basic Data on the Economy of the British Virgin Islands, by Lawrence J. Comella, OBR 64-110, 8 pp., illus., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) These 32 islands with a land area of 58 square miles are situated about 60 miles east of Puerto Rico and about 140 miles northwest of St. Kitts. The report discusses geography, population, and government; structure of the economy--agriculture, fishing, forestry, tourism, transportation, communications, utilities, labor, housing, currency, and development programs; and foreign trade,

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including customs tariff. Included are statistical tables on foreign trade, 1958-61; imports by principal suppliers, 1961; and imports of principal commodities, 1961.

CALIFORNIA:

California Fish and Game, vol. 50, no. 4, October 1964, 95 pp., illus., printed, single copy 75 cents. Documents Section, P.O. Box 1612, Sacramento, Calif. 95807. Includes, among others, articles on: "Age and length composition of the sardine catch off the Pacific Coast of the United States and Mexico in 1961-62," by Anita E. Daugherty and Robert S. Wolf; and "Report on a recent shark attack off San Francisco, California," by Ralph S. Collier.

CANADA:

Journal of the Fisheries Research Board of Canada, vol. 21, no. 3, May 1964, 232 pp., illus., printed, single copy C\$2. Queen's Printer, Ottawa, Canada. Includes, among others, articles on: "Seasonal distribution of cod (*Gadus morhua* L.) along the Canadian Atlantic coast in relation to water temperature," by Yves Jean; "Cod roe: component fatty acids as determined by gas-liquid chromatography," by R. G. Ackman and R. D. Burgher; "Tributary homing of sockeye salmon at Brooks and Karluk Lakes, Alaska," by Wilbur L. Hartman and Robert F. Raleigh; "The primary production of a British Columbia fjord," by Malvern Gilmartin; "Polyphosphate treatment of frozen cod. 2--Effect on drip, yield, lipid hydrolysis and protein extractability in twice-frozen Newfoundland summer trap and fall cod," by W. A. MacCallum and others; "Incidence of *Ligula intestinalis* in Herring Lake fish," by G. H. Lawler; "Cooking method and palatability of frozen cod filets of various qualities," by W. J. Dyer; "Fecundity of the American plaice, *Hippoglossoides platessoides* (Fabr.) from Grand Bank and Newfoundland areas," by T. K. Pitt; "Net avoidance behavior of carp and other species of fish," by John R. Hunter and Warren J. Wisby; "A vacuum-assisted subsampler for use with small planktonic organisms," by Robert A. McHardy; "Further evidence of hardness of 'silver' pike," by G. H. Lawler; "Utilization of lipids by fish. III--Fatty acid oxidation by various tissues from sockeye salmon (*Oncorhynchus nerka*)," by R. E. E. Jonas and E. Bilinski; and "An unusually late-spawning British Columbia chum salmon," by W. Percy Wickett.

CANNING:

Revolutionary Canning Process, by Howard P. Millville, 8 pp., illus., printed. (Reprinted from Food Processing, March 1964.) Swift & Company, Grocery Division, 115 W. Jackson Blvd., Chicago, Ill. 60604. Discusses a continuous processing production unit now in operation in a Missouri plant that eliminates retorting required in the conventional canning of foods. The retort is a pressurized chamber where, in the conventional canning process, steam heats the sealed cans of food to sterilizing temperature. In the new process, the filling operation is conducted in a pressurized chamber or room so that the foods are at sterilizing temperatures when filled and sealed into the cans. Flavor of the products is excellent and shelf life is reported as being surprisingly good. A letter from the patentee states: "Up to the present time research and prod-

uct development activity has been concentrated in the area of canned meat products. We feel that the process can well have benefits when applied to the canning of fish but no research has been done in this direction and none is currently scheduled."

CARP:

"Carp control gets results," by Barney Wanie, article, Wisconsin Conservation Bulletin, vol. 28, no. 6, 1963, pp. 22-23, illus., printed, Wisconsin Conservation Department, Box 450, Madison 1, Wis.

CATFISH:

"The channel cat," by Alan H. Finke, article, Wisconsin Conservation Bulletin, vol. 29, no. 2, 1964, pp. 18-19, illus., printed.

CEYLON:

Foreign Trade Regulations of Ceylon, by Jackson B. Hearn, OBR 64-116, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Ceylon's trade policy is designed to adjust imports to the country's economic needs within the limits of available foreign exchange resources. In addition to trade policy, the report discusses import tariff system, documentation, and labeling and marketing requirements. Also covers special customs provisions, nontariff import controls, Ceylon's export controls, United States foreign trade controls, and Government representation between Ceylon and the United States.

CHEMICAL CONTENT:

"Determination of Zirconium 95 and Niobium 95 in seaweed and sea water," by B. L. Hampson, article, Analyst, vol. 88, July 1963, pp. 529-533, printed, Analyst, W. Heffer & Son, Ltd., Cambridge, England.

CHESAPEAKE BAY:

Chesapeake Science, vol. 5, no. 3, September 1964, 51 pp., illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Includes, among others, these articles: "Length increment during terminal molt of the female crab, *Callinectes sapidus*, in different salinity environments," by Paul A. Haefner, Jr. and Carl N. Shuster, Jr.; "Fish distribution at varying salinities in Neuse River Basin, North Carolina," by Lewell Keup and Jack Bayless; "Uptake and retention of Rhodamine B by Quahog clams, *Merccenaria mercenaria*," by J. R. Geckler and T. A. Wandstrat; "Morphometry of the common Atlantic squid, *Loligo pealei*, and the brief squid, *Lolliguncula brevis*, in Delaware Bay," by Paul A. Haefner, Jr.; and "Growth compensation in four year classes of striped bass, *Morone saxatilis*, from Albemarle Sound, North Carolina," by William R. Nicholson.

CLAMS:

Dried Unicellular Algae as Food for Larvae of the Hard Shell Clam, *MERCENARIA MERCENARIA*, by Herbert Hidu and Ravenna Ukeles, 17 pp., illus., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 53, 1962, pp. 85-101.) National Shellfisheries Association, Virginia Institute of Marine Science, Gloucester Point, Va.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

COD:

"Cooking method and palatability of frozen cod fillets of various qualities," by W. J. Dyer and others, article, Journal of the Fisheries Research Board of Canada, vol. 21, 1964, pp. 577-589, printed. Queen's Printer, Ottawa, Canada.

1950-1954 Distribution of Spawning Shoals of Cod in Bornholm Basin in the Light of Varying Environmental Factors (Rozmieszczenie Lawic Rozrodczych Dorsza w Basenie Bornholmskim w Latach 1950-1954 w Swietle Zmiennych Czynnkow Srodowiska), by Jan Elwertowski, OTS 61-11359, 14 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, Prace Morskiego Instytutu Rybackiego w Gdyni, vol. 10/A, 1959, pp. 361-374.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

COLD STORAGE:

Progres dans la Science et la Technique du Froid--Comptes Rendus du XI^e Congres International du Froid, Munich (Allemagne), 1963 (Progress in Refrigeration Science and Technique, Report of the 11th International Congress of Refrigeration, Munich, Germany, 1963), 3 Vols., printed in French and English, 1964, \$40. International Institute of Refrigeration, 177, Blvd. Malesherbes, Paris (17^e), France. Volume II discusses problems of refrigeration of fish. It also contains a section on Commission 6 c, pertaining to theory and industrial development of freeze-drying, and its medical and biological application.

CONTAINERS:

"El envase de aluminio para conservas de pescado" (The aluminum container for canned fish), article, Informacion Conservera, vol. 12, no. 127, July 1964, pp. 278, 279, printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Informacion Conservera, Colon, 62, Valencia, Spain.

"Solubility of tin in canned marine foods on the market," by Chong Hun Won, article, Chemical Abstracts, vol. 58, April 15, 1963, 8356a, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

CRABS:

Reprint from Transactions of the American Fisheries Society, vol. 93, no. 3, July 1964. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005: Fishing Mortality and Movements of Adult Male King Crabs, PARALITHODES CAMTSCHATICA (Tilesius), Released Seaward from Kodiak Island, Alaska, by Guy C. Powell, 6 pp. (pp. 295-300), illus., printed.

Tag Loss during Ecdysis by the King Crab, PARALITHODES CAMTSCHATICA (Tilesius), by George W. Gray, Jr., 2 pp. (pp. 303-304), printed.

"Relative abundance of edible crabs of family Portunidae in Karachi offshore waters," by Syed Salah-ud-Din Hashmi, article, Pakistan Journal of Science, vol. 15, no. 3, 1963, pp. 115-119, printed. Pakistan Association for the Advancement of Science, Lahore, Pakistan.

CRUSTACEANS:

Serial Atlas of the Marine Environment--Euphausiids and Pelagic Amphipods, Distribution in North Atlantic and Arctic Waters, by Maxwell J. Dunbar, Folio 6, 10 pp., illus., printed, 1964, \$7. Serial Atlas of the Marine Environment, American Geographical Society, Broadway at 156th St., New York, N. Y. 10032. This folio presents the North Atlantic and Arctic distribution of 8 species of pelagic crustacea, northward from the Labrador coast and the British Isles. Essentially a study of the northern limits of the southern forms, and the southern limits of the northern forms. Anomalies in distribution, in terms of Arctic, Subarctic, and Atlantic water masses are brought out, and the relevance of pelagic distribution studies to water mass, food supply, and ecosystem complexity is discussed briefly. The 8 species mapped are Meganyctiphanes norvegica (M. Sars), Thysanoessa longicaudata (Krøyer), T. inermis (Krøyer), T. raschii (M. Sars), Parathemisto gaudichaudi (Guerin), P. abyssorum (Boeck), P. libellula (Mandl), and Gammarus wilkitzkii Birula. This study forms Folio 6 of the Serial Atlas, which is being issued as a series of separate folios, each a complete study in itself of a physical, biological, chemical, or geological aspect of the ocean.

DENMARK:

Fiskeriberetning for Aret 1963 (The Ministry of Fisheries Annual Report for 1963), 136 pp., illus., printed in Danish with English summary, Kr. 7.50 (about US\$1.10). Fiskeriministeriet, 1 Kommission Hos, G. E. C. Gad, Copenhagen, Denmark. Includes information and statistical tables on number of fishermen employed, fishing vessels and gear, and landings of fish and shellfish. Also contains information on trout farms; production of canned, filleted, and smoked fish; and foreign trade in fishery products; organization of Fisheries Ministry; and legislation pertaining to fisheries.

DOGFISH:

"Long journey of the dogfish," by Walter N. Hess, article, Natural History, vol. 73, no. 9, November 1964, pp. 32-35, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park W. at 79th St., New York, N. Y. 10024. Discusses the life history and annual migrations of the dogfish, Squalus acanthias, from the Virginia-Carolina coastal waters to Labrador. One of the great mysteries about the migration and feeding activities of these small sharks is how they keep together in packs, since the sea is so spacious and is relatively dark at the depths where they are usually found. Like their larger relatives, S. acanthias have an exceedingly keen sense of smell and a lateral line sense for detecting vibrations in water; these may help them stay together. Their round-trip of 2,500 miles a year, or ten miles a day, is certainly a most exceptional feat of migration.

DOLPHIN:

Commercial Utilization of Dolphins (Porpoises) in Ceylon, by A. W. Lantz and C. Gunasekera, Bulletin No. 3, 14 pp., illus., printed, 1955. Department of Fisheries, Colombo, Ceylon. Describes in detail the commercial possibilities in the capture and utilization of two species of dolphins abundant in waters adjacent to Ceylon. Outlines the method of capture and use of

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dolphin meat for human consumption, together with recipes for cooking. The possibility of using dolphin skin as a fine leather is also discussed, and the process for tanning the skin is explained. In conclusion the authors state that "Fresh dolphin meat when placed on the market sold readily despite some local prejudice against the naturally dark-coloured meat. The flesh of the dolphin is nutritious and can be used successfully in both western and eastern types of cookery. An effort should be made to popularize the dolphin flesh as a high-quality protein food. The price should be reasonable so that low-income groups may benefit from its use and nutritional properties." The authors add that "The skin of the dolphin can be tanned to yield at least two kinds of excellent quality leather. The blubber layer which lies immediately under the skin can be rendered into commercially valuable oil. Unused portions such as parts of the head, the bones, viscera and flesh trimmings can be processed into meal for additions to animal feeds or for soil fertilization. The process of manufacture is similar to that used for production of fish meals."

Morphological Basis for the Ultrasonic and Sonic Detection Characteristics of the Dolphin, by V. P. Zvorykin, OTS 63-31738, 15 pp., processed, September 11, 1963, 50 cents. (Translated from the Russian, *Arkhiv Anatomii, Gistologii i Embriologii*, no. 7, 1963, pp. 3-17.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

The Secrets of the Dolphin, by Helen Kay, 120 pp., illus., printed, 1964, \$3. The MacMillan Co., 60 Fifth Ave., New York, N. Y. 10011. The most playful yet intelligent mammal--the dolphin or porpoise--is the main character in this book. Jacques-Yves Cousteau says: "The brain of a porpoise is the same weight and size in comparison to its body as man's." This is no fiction story, but a true story. Careful research and the use of many sources has resulted in a true but delightful popular description of this mammal. Anecdotes, history, legend, and scientific facts are blended together into a panoramic picture of the dolphins. Today dolphins are top attractions for sightseers visiting at the many marine aquariums found in the United States and other parts of the world. Scientists also are delving into the dolphin's ability to understand and to learn quickly. Human personalities are almost imparted to the particular dolphins the author describes in Part I, which is titled "Dolphins are Delightful!" The second part is devoted to the legends and lore surrounding the dolphin. In the part on legends, one chapter is titled: "Were the Dolphin Riders Legend?"; and the other chapters deal with the dark ages of the dolphin; "Pilot Jack"; and "You Can Swim Like a Dolphin." In Part III, dealing with the secrets of the dolphin, are found chapters on the porpoises and sonar; porpoise watching; how the dolphins hear without an ear; "This Man Talks to Dolphins"; and the porpoises of Point Mugu. Included is an appendix, "What's in a Name?"; a small but interesting bibliography; and an adequate index for quickly locating some of the many bits of information the book contains. Written for the young reader, it still makes fascinating reading for any adult young at heart or for reading out loud to a group of children.

-- Joseph Pileggi

ECUADOR:

Apuntes e Informaciones sobre las Pesquerias en las Provincias del Guayas y los Rios (Memoranda and Information on the Fisheries in the Provinces of Guayas and los Rios), *Boletin Informativo*, vol. 1, no. 4, 85 pp., illus., printed in Spanish, 1964. Instituto Nacional de Pesca del Ecuador (Biblioteca), Casilla 5918, Guayaquil, Ecuador.

EUROPEAN FREE TRADE ASSOCIATION:

Fourth Annual Report of the European Free Trade Association, 1963/1964, 30 pp., printed, Sept. 1964, \$1. European Free Trade Association, 711 14th St. NW., Washington, D. C. 20005.

FACTORYSHIP:

"On board the *Constanta*," by E. B. Slack, article, *World Fishing*, vol. 13, June 1964, pp. 63-64, 67-68, printed. John Trundell and Partners Ltd., St. Richard's House, Eversholt St., London NW1, England. Discusses the 10-day visit of the author on board the Rumanian factory trawler *Constanta* to meet its staff and share their working and off-duty experiences on board the vessel. Of the capital investment in the vessel, about \$1 million is in the form of elaborate scientific and technological equipment. She is the largest factory trawler yet in operation, and pulls the largest trawl net ever designed. Estimates place her catching performance at about 80 tons in 24 hours. The largest single haul was made in one trawling period of about 2 hours and was estimated to be about 15-20 tons. The trials, conducted off New Zealand, were considered to be highly successful and the vessel will operate in the future in North Atlantic waters.

FAT:

"Results of recent investigations on fats of sea- and fresh-water animals," by T. H. Khoe, article, *Chemical Abstracts*, vol. 59, August 19, 1964, 4301c, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

FATTY ACIDS:

"Positional distribution of fatty acids in fish and other animal lecithins," by Daniel B. Menzel and H. S. Olcott, article, *Biochimica et Biophysica Acta*, vol. 84, April 20, 1964, pp. 133-139, printed. Elsevier Publishing Co., P. O. Box 211, Amsterdam, Netherlands.

FEEDING:

Feeding and Food Relationships of Fishes in the Piedmont Tributaries of the Lower Amur River (*Pitanie i Pishchevye Otnosheniya Ryb v Predgornnykh Pritokakh Nizhnego Tcheniya Amura*), by V. Ya. Levandov, OTS 63-11104, 18 pp., processed, 1964, 50 cents. (Translated from the Russian, *Voprosy Ikhtologii*, No. 13, 1959, pp. 139-155.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Method of Estimating the Production of Organisms

Serving as Food for Fishes (*K Metodike Opredeleniya Produktivnosti Kormovykh Dlya Ryb Zhivotnykh*), by A. S. Konstantinov, OTS 63-1115, 5 pp., processed, 1964, 50 cents. (Translated from the Russian, *Nauchnye Doklady Vysshei Shkoly, Biologicheskie Nauki*, no. 4, 1960, pp. 59-62.)

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

FILLETS:

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"Filleting Fish," Patent No. 928, 733, article, Food Manufacture, vol. 39, March 1964, p. 87, printed, Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

FISH BEHAVIOR:

Methods of Studying the Schooling Behavior of Fishes (O Metodakh Izucheniya Stainogo Povedeniya Ryb), by Yu. E. Milanovskii and V. A. Rekubratskii, OTS 63-11116, 6 pp., processed, 1964, 50 cents. (Translated from the Russian, Nauchnye Doklady Vysheishkoly, Biologicheskii Nauki, no. 4, 1960, pp. 77-81.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Orientation of Fishes, by Arthur D. Hasler, Final Report for 1 Sep 57-30 Aug 63, 16 pp., printed, May 1963. University of Wisconsin, Madison, Wis.

The Role of the Sun's Altitude in Sun Orientation of Fish, by Horst O. Schwassmann and Arthur D. Hasler, 16 pp., printed, April 1964. (Reprinted from Psychological Zoology, vol. 37, no. 2, April 1964, pp. 163-177.) Laboratory of Limnology, University of Wisconsin, Madison, Wis.

Use of Mechanical Devices in Studying the Distribution and Behavior of Commercial Fishes (Opyt Primeneniya Tekhnicheskikh Sredstv Izucheniya Raspredeleniya i Povedeniya Promyslovnykh Ryb), by O. N. Kiselev, OTS 63-11114, 4 pp., processed, 1964, 50 cents. (Translated from the Russian, Trudy Sovetskoi Ikhhtiologicheskoi Komissii Akademii Nauk SSSR, no. 10, 1960, pp. 235-238.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

FISH COOKERY:

Frozen King Crab, 25 cards, illus., printed. Wakefield's Deep Sea Trawlers, Inc., Fishermen's Terminal, Seattle 99, Wash. A set of 25 3½-inch by 5½-inch cards containing recipes for preparing king crab, with color-illustrated dividers. Sections include product information; and recipes for salads, king crab legs, and hot dishes. Some of the recipes include crab louis, crab leg appetizer with Mediterranean sauce, crab meat Caribbean, crab imperial, and crab meat Newburg.

FISH FOOD:

"Pelleted fish food," article, Feedstuffs, vol. 36, July 11, 1964, p. 16b, printed. Feedstuffs, P. O. Box 67, Minneapolis, Minn. 55440.

FISHING EFFORT:

Licence Limitation as a Means of Controlling Fishing Effort, by G. L. Kesteven and G. R. Williams, Reprint 536, 14 pp., illus., processed. (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

FISHING WITH LIGHTS:

"Pêche au feu" (Fishing with lights), by J. P. Gapihan, article, France Pêche, no. 88, October 1964, pp. 40-41, illus., printed in French, single copy 2.5 F (about 50 U. S. cents). France Pêche, Boite Postale 179, Lorient, France.

FISH-LIVER OIL:

Contribucion al Estudio Fisicoquimico de los Aceites de Hígado de Pescado (Contribution to the Physical-Chemical Study of Fish-Liver Oils), by Manuel Calvo Mendoza, 48 pp., illus., printed in Spanish, 1962. Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

"Effect of sunlight and air on cod-liver oil," by Stanislaw Byczkowski and Wanda Kiewlicz, article, Chemical Abstracts, vol. 58, April 15, 1963, 8152c, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

FISH OIL:

"Oxidizing deterioration of medicinal fish oils," by V. G. Parteshko, article, Chemical Abstracts, vol. 60, April 27, 1964, 10479d, printed.

"Partial characterization of the hydrocarbons of herring oil," by Georg Lamberts and Ralph T. Holman, article, Chemical Abstracts, vol. 58, June 10, 1963, 12778a, printed.

"Use of fish oil fractions in human subjects," by Kun-itaro Imaichi and others, article, Chemical Abstracts, vol. 59, December 9, 1963, 14354g, printed.

FISH PASSAGE:

First Results of the Operation of the Fish Pass at the Volga Hydroelectric Station Named "XXII Congress of the KPSS", by L. M. Nusenbaum, 4 pp., processed, 1963. (Translated from the Russian, Rybnoe Khoz-iaistvo, vol. 37, no. 11, 1961, pp. 13-18.) Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., Canada.

FISH PROTEIN CONCENTRATE:

"Odorless fish flour," by Yohei Hashimoto and Kazuo Miura, article, Chemical Abstracts, vol. 60, March 2, 1964, 6144b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Some aspects of the technology of fish flour," by M. N. Moorjani and N. L. Lahiry, article, Review of Food Science and Technology, vol. 4, 1962, pp. 113-136, printed. Central Food Technological Research Institute, Mysore, India.

FISH SAUCE:

"Study on the production of fish sauce. I--Effect of commercial proteolytic enzymes on the production of fish sauce," by S. Murayama, D. L. Calvez, and P. Nitayachin, article, Bulletin, Tokai Regional Fisheries Research Laboratory, no. 32, 1963, pp. 155-162, printed in Japanese. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

FISH SPOTTING:

"La detección de los bancos de peces por medio de helicópteros" (The detection of fish schools by means

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of helicopters), by M. Yves Bourdreault, article, Puntal, vol. 11, no. 125, August 1964, pp. 2-3, 5, 7, illus., printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

FOOD AND AGRICULTURE ORGANIZATION:

FAO--Its Organization and Work and United States Participation, by Ralph W. Phillips, FAS-M-93-Revised, 30 pp., illus., processed, August 1964, Foreign Agricultural Service, Rm. 5918, U. S. Department of Agriculture, Washington, D.C. 20250. This publication is designed to provide information on the manner in which the Food and Agriculture Organization (FAO) was established, how it has developed during its first two decades, and ways in which the United States participates. Also, it provides background on membership, governing bodies, organizational structure, and programs.

Informe Provisional de la Ila Reunion de "C.A.R.P.A.S." Celebrada en Mar del Plata (Argentina) del 27 al 30 de Abril de 1964, (Provisional Report on the Second Meeting of C.A.R.P.A.S. Held in Mar del Plata, Argentina, April 27-30, 1964), 23 pp., processed in Spanish, distribution limited. Comision Asesora Regional de Pesca para el Atlantico Sudoccidental, Rua do Jardim Botânico No. 1008, Rio de Janeiro, Brazil. C.A.R.P.A.S. is the Regional Fisheries Advisory Commission for the Southeast Atlantic.

Proceedings 10th Session, Seoul, Korea, 1962. Section II--Technical Papers, 330 pp., printed, 1963. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Second Report to the Government of the United Arab Republic on Fishery Investigations on the Nile River, the Lakes and the Pond Farms in Egypt, by Wilhelm F. J. Wunder, ETAP Report No. 1640, 25 pp., illus., processed, 1963.

Fourth Report to the Government of India on Fishing Boats, by Albert Sutherland, ETAP Report No. 1710, 46 pp., illus., processed, 1963.

Report to the Government of Rhodesia and Nyasaland on the Fisheries Development Program for Lake Tanganyika, by Alphonse Collart, ETAP Report No. 1716, processed.

Report on the Regional Training Center on Fish Processing Technology Held at Quezon City, Philippines, by Rudolph Kreuzer, ETAP Report No. 1725, processed.

Report to the Government of El Salvador on Development of Inland Fisheries, by S. Y. Lin, ETAP Report No. 1735, 28 pp., illus., processed, 1963.

Informe al Gobierno de Chile sobre Cooperativas Pesqueras (Report to the Government of Chile on Fishery Cooperatives), by Paulino San Emeterio, ETAP Report No. 1764, processed.

Informe al Gobierno de Honduras sobre los Recursos de Camarones (Report to the Government of Honduras on the Shrimp Resources), by Harold Loesch, ETAP Report No. 1787, processed.

FOREIGN TRADE:

"Lending agencies help," by Ada Wrigley, article, International Commerce, vol. 70, no. 46, November 16, 1964, pp. 5-11, illus., printed, single copy 35 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Two United States agencies and several international institutions provide loans which help U. S. exporters and investors. Their purposes, resources, spheres of operation, and loan requirements vary considerably. This article and the accompanying chart provide an up-to-date summary of the purposes and character of these institutions insofar as their major lending operations are concerned. Discusses the Export-Import Bank, Agency for International Development, World Bank (comprising the International Bank for Reconstruction and Development, International Development Association, and the International Finance Corporation), and the Inter-American Bank.

FRANCE:

"La production de la pêche française en 1963" (The French fishery production in 1963), article, La Pêche Maritime, vol. 43, no. 1037, August 1964, pp. 579-585, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

FREEZE DRYING:

"Freeze-dried foods flavour ratings," article, Food Manufacture, vol. 39, May 1964, p. 68, printed, Gramplan Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

"Rapid reconstitution of freeze-dried foods," by F. Fidler, article, Food Manufacture, vol. 39, June 1964, p. 55, printed.

"Suska ryby metodom sublimacii" (Freeze drying of fish), by A. K. Kaminarskaja, article, Kholodil'naia Tekhnika, no. 6, 1962, pp. 42-45, illus., printed in Russian. Four Continent Book Corp., 822 Broadway New York, N. Y. 10003.

FREEZER TRAWLER:

"All freezer trawler," article, Modern Refrigeration, vol. 66, no. 788, November 1963, pp. 1026-1029, printed, Refrigeration Press Ltd., Maclaren House, 131 Great Suffolk St., London SE1, England.

FREEZING ON BOARD:

"Nuevos métodos para congelar pescados en alta mar" (New Freezing processes for fish on the high seas), article, La Técnica del Frío, vol. 11, no. 105, July-August 1963, pp. 52-68, illus., printed in Spanish.

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Calveiro y Liberatore, 436 Rio Bamba, Buenos Aires, Argentina.

FRENCH GUIANA:

Basic Data on the Economy of French Guiana, by Walter Haidar, OBR 64-111, 8 pp., illus., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) French Guiana, an underpopulated and underdeveloped land of potential wealth, depends heavily on the French Government for financial and technical assistance. That government is fostering a policy of economic development; and public spending, mainly for the improvement of port facilities, roads, and utilities, was increased in 1963. The report discusses geography and climate, population and employment, and Government; national income; agriculture, forestry, and fishing; mineral resources; industry; transportation, communications, and utilities; public and private investments and sales potentials; development programs; financial situation; and foreign trade. The seas bordering Guiana abound in turtles, shellfish of all kinds, mullet, tuna, swordfish, and a great variety of shrimp.

FRESHNESS:

"Un nuovo apparecchio per la determinazione istantanea della freschezza del pesce: il Fish Tester V" (A new device for the instant determination of the freshness of fish: the Fish Tester V), article, La Pêche Maritime, vol. 43, 1964, p. 121, printed in French. Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

FRESH-WATER FISHERIES:

"Freshwater fisheries--problems and potential," by John S. Lake, article, Fisheries Newsletter, vol. 23, no. 9, September 1964, pp. 24-25, 27, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia.

FROZEN FISH:

"Accent on frozen fish and seafood profits," by Robert J. Gruber, article, Quick Frozen Foods, vol. 26, April 1964, p. 49, printed. E. W. Williams Publications, Inc., 82 Wall St., New York, N. Y. 10005.

"Decongelazione del pesce per mezzo dell'alta frequenza" (Electronic thawing of frozen fish), by M. Benezit, article, Revue Generale du Froid, vol. 41, 1964, p. 53, printed. Association Française du Froid, 29 Blvd. Saint-Germain, Paris (6^e), France.

"Le transport des poissons surgelés" (Transport of frozen fish), by R. Reynaud, article, Revue Generale du Froid, vol. 41, no. 1, January 1964, pp. 37-43, illus., printed in French.

Electrical Resistance Thawing of Fish, by H. R. Sanders, Torry Memoir No. 143, 5 pp., illus., printed, 1963. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland.

"Modern Danish view on the handling and distribution of frozen fish," by Mogens Jul, article, Food Technology, vol. 17, August 1963, pp. 46-48, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

"Die sache mit dem aufgetauten frostfisch" (The problem of thawed frozen fish), by K. Bahr, article, Tieskuhlkette, no. 90, June 1963, pp. 16-18, printed in German. H. E. Albrecht Verlag KG., Freihamerstrasse No. 2, Munich, Federal Republic of Germany.

GEAR:

Fishing Power Studies, by J. E. Paloheimo, Manuscript Report Series (Biological) No. 789, 2 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

"On working performance of net-hauling machines of different types," by R. T. Mikhailov, article, Rybnoe Khoziaistvo, vol. 38, no. 11, 1962, pp. 59-64, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

The following papers (in English with French and Spanish abstracts) were presented at the Second World Fishing Gear Congress, London, May 25-31, 1963:

Development of Electrical Shrimp Trawling Gear, by F. Wathne, 12 pp., illus., processed. U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Fla.

Double-Rig Shrimp Beam Trawling, by J. Verhoest and A. Maton, 20 pp., illus., processed. Commissie T.W.O.Z., University of Agriculture, Ostend, Belgium.

Prospective Developments in Harvest of Marine Fishes, by D. L. Alverson and N. J. Wilimovsky, 16 pp., illus., processed. Exploratory Fishing and Gear Base, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

Shrimp Behavior Related to Gear Research and Development, by C. M. Fuss, Jr., 12 pp., illus., processed. U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Fla.

GENERAL:

Preliminary List of Information Sources Relating to Fisheries Sciences, by A. Soulier, Occasional Paper 64/4, 13 pp., printed, 1964. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

Sea Fishing for Pleasure and Profit, by R. C. O'Farrell, 126 pp., illus., printed. Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England.

GERMAN FEDERAL REPUBLIC:

Fischerei, I--Fangergebnis der See- und Küstentischerei, 1963 Vorbericht (Fisheries, I--High-Seas and Coastal (Fishery) Catch Results, 1963 Preliminary Data), Land- und Forstwirtschaft, Fischerei, Series 4, 7 pp., processed in German. Verlag W. Kohlhammer GmbH, Stuttgart and Mainz, German Federal Republic.

Informationen für die Fischwirtschaft, vol. 11, no. 2, 1964, 37 pp., illus., processed in German. Bundesforschungsanstalt für Fischerei, Palmallee 9, Hamburg-Altona 1, Federal Republic of Germany. Includes, among others, these articles: "Westafrika-reise des FFS Walther Herwig" (West Africa voyage

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of the fishery research vessel Walther Herwig, by A. von Brandt; "Die Fanggebiete der Deutschen Fischerei" (The fishing grounds of German fisheries), by A. Meyer; "Impulszahlen und stromdichtewerte beim elektrischen anfang" (Impulse and current density in electrofishing for eels), by E. Halsband; and "Zur frage der qualitat und haltbarkeit auf see tiefgefrorener und an land aufgetauter fische" (The quality and keeping properties of fish frozen at sea and thawed on land), by N. Antonacopoulos.

Informationen fur die Fischwirtschaft, vol. 11, no. 3, 1964, 41 pp., illus., processed in German. Includes, among others, these articles: "Die verhandlungen der Nordatlantischen Fischerei-Kommission" (Negotiations of the Northeast Atlantic Fisheries Commission), by D. Sahrhage; "Die internationale diskussion uber die schonung der Nordsee-heringe" (The international discussions on the conservation of the North Sea herring), by G. Hempel; and "Monatskarten der Deutschen grossen heringsfischerei fur 1963 (Monthly reporting on German high-seas herring fishery for 1963), by K. Schubert.

GROUND FISH:

The Homogeneity of Canadian Samples for Lengths and Ages of Commercially-Caught Cod and Haddock, by L. M. Dickie, Manuscript Report Series (Biological) No. 787, 5 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

GULF OF MEXICO:

Bulletin of Marine Science of the Gulf and Caribbean, vol. 14, no. 3, 1964, 147 pp., illus., printed, single copy \$2. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149. Contains, among others, articles on: "Tagging experiments on the flying fish Hirundichthys affinis (Günther)," by John B. Lewis; "A note on three specimens of the squid Lampadoteuthis megaleia Berry, 1916 (Cephalopoda: Oegopsida) from the Atlantic Ocean, with a description of the male," by Richard E. Young; and "A note on some cephalopods from Brazil, with a description of a new species of octopod, Eledone Massyae," by Gilbert L. Voss.

HALIBUT:

Investigation, Utilization and Regulation of the Halibut in Southeastern Bering Sea, by Henry A. Dunlop and others, Report No. 35, 72 pp., illus., printed, 1964. International Pacific Halibut Commission, Fisheries Hall No. 2, University of Washington, Seattle 5, Wash. Reviews the pertinent facts regarding the halibut, the fishery, and the management and utilization of the resource in the north Pacific Ocean and Bering Sea. Covers the occurrence of halibut in the Bering Sea, early life history of the halibut and hydrography of its habitat, commercial availability in the Bering Sea, review of regulations, statistics of the Canadian and United States set-line fishery, and Japanese and Russian trawl fisheries. It also discusses tagging studies conducted between 1930 and 1959, studies of the composition of the stock, growth studies, stock relationships, utilization of the catch, and maximum sustainable yield from Area 3B North Triangle.

HERRING:

"Brown discoloration in pickled herring," by A. Ruiter, article, Deutsche Lebensmittel-Rundschau, vol. 59, no. 4, 1963, pp. 110-111, printed in German. Wissenschaftliche Verlagsgesellschaft, m.b.h., Birkenwaldstrass 44, Stuttgart N., Germany.

"Chemical studies on the herring (Clupea harengus). IX--Preliminary gas-chromatographic study of volatile sulphur compounds produced during the cooking of herring," by R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 15, May 1964, pp. 290-292, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Free Amino Acids in Hard Herring Roe. Variation during the Ripening Process, by Egil T. Gjessing, Fiskeridirektoratets Skrifter Serie Teknologiske Undersøkelser, vol. 4; no. 7, 1963, 8 pp., printed. Fiskeridirektoratets, Bergen, Norway.

"Markierungen an Rügenschens frühjahrsheringen in jahre 1961" (Tagging Rugen spring herring in 1961), by Karl Anwand, article, Internationale Revue der Gesamten Hydrobiologie, vol. 48, no. 2, 1963, pp. 315-323, printed in German. Internationale Revue der Gesamten Hydrobiologie, Berlin, Germany.

"Maturation of fatty Pacific salted herring packed in refrigerator drawers," by L. K. Bukhriakova, article, Sb. Rabot. po Biol. Takhn. Rybolovstva i Takhnol. Tikhookeansk. Nauchno-issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, no. 1, 1960, pp. 74-81, printed in Russian. Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnol'skaia Ul. No. 17, Moscow, U.S.S.R.

Poissons du Quebec: Album No. 7, Le Hareng (Fishes of Quebec; Album No. 7, the Herring), by Jean-Marie Roy, 16 pp.; 23 pp. translation, illus., printed, French and English, respectively, 1964, 50 Canadian cents. Division des Pêcheries, Ministère de l'Industrie et du Commerce, Quebec, Que., Canada. Discusses the herring's systematic position, common names, distinctive characteristics, habitat, size and weight, sex characteristics, spawning, food, and growth. Also covers herring enemies; geographical distribution; fishing methods--gill-net, drift-net, weir fishing, boat seine, and herring trap; importance of the Quebec fishery; and utilization of the catch.

"The question of the origin of betabacteria (lactobacteria) in marinated herring," by K. Priebe, article, Archiv fur Lebensmittelhygiene, vol. 13, no. 12, 1962, pp. 278-281, printed in German. Verlag M & H Schaper, Grazer Str., 20, Hannover, Germany.

Review of Canadian Herring Fishery and Research in the ICNAF Area, 1963, by S. N. Tibbo, Manuscript Report Series (Biological) No. 791, 4 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

"Volatile acids as basis for estimating suitability of fish for consumption. I--Salted herring," by J. Wierchowski and M. Severin, article, Roczniki Panstwowe Zakladu Higieny, no. 13, 1962, pp. 301-305, printed.

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ed in Polish with summaries in English and Russian.
Panstwowy Zaklad Wydawnictw Lekarskich, ul.
Chocimska, 22, Warsaw, Poland.

ICE:

"L'approvisionnement des bateaux de pêche en glace hydrique" (Supplying fishing boats with water ice), by A. d'Oiron, article, *Revue Generale du Froid*, vol. 41, no. 1, January 1964, pp. 27-34, illus., printed in French. Association Française du Froid, 29 Blvd. Saint-Germain, Paris (6^e), France.

ICELAND:

Foreign Trade Regulations of Iceland, by Ann C. Holmes, OBR 64-107, 8 pp., printed, Sept. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Iceland's import policy is closely allied with the operation of the fishery export industry. Her economy is highly dependent upon the maintenance of fish exports in order to pay for the importation of most necessities except some foods. Fishery products represent over 90 percent of Iceland's exports. The report discusses Iceland's trade policy; import tariff system; sales and other internal taxes; documentation; and labeling, marking, and packing requirements. Also covers special customs provisions; nontariff import controls; Iceland's export controls; United States foreign trade controls; and Government representation between the two countries.

ICHTHYOLOGY:

Anatomie der Fische (Anatomy of the Fish), by Wilhelm Harder, *Handbuch der Binnenfischerei Mitteleuropas*, vol. IIA, part 1 - 320 pp., part 2 - 123 pp., illus., printed in German, 1964, 94 DM paperback (about US\$23.50); 130 DM (about \$32.50) hardbound. E. Schweizerbart'sch Verlagsbuchhandlung (Nagelle u. Obermiller), Stuttgart, Federal Republic of Germany. The author, Dr. Wilhelm Harder, is well known to many American fishery biologists. He spent some time here in the United States working at several biological laboratories. In the forward to his present work he indicates that a detailed volume on the anatomy of the fish has not appeared in German since the work of Stannius in 1854. Accordingly, he has taken upon himself the task of producing a detailed volume on this subject. The volume is in two separate parts; text and illustrations, so that it is possible to put the illustrations alongside the corresponding text. The main chapter headings, under which considerable specific detail is given, are as follows: basic elements of the organs, cells, and tissues; skeleton--skull, fins, skin structure, teeth; muscle structure; body cavity, digestive tract; urinary and sexual organs; circulatory system--heart, lymph nodes; organs of inner secretion; respiratory system; sensory organs; nervous system; and skin. There are 246 pages of text in German in the first part which also includes 13 tables and literature citations. The second part contains about 266 illustrations with 19 tables. Zoologists and zoological institutes, scientific aquaria, libraries of aquarium societies, biologists, fishery scientists will find this book of considerable value.

--W. H. Stolting

INDIA:

Fish Technology Newsletter, vol. 5, no. 2, July 1964, 17 pp., illus., processed, Central Institute of Fisheries Technology, Ernakulam, India. Includes, among others; articles on: "Canning of mackerel in oil;" "Fishery products of commerce. III--Fish maws;" "Design of a 85'-four seam trawl net for 120-130 hp. trawler;" and "Simple Techniques for Estimating Certain Characteristics of Otter Trawl Net in Operation."

Indian Seafoods, vol. 2, no. 1, June 1964, 30 pp., illus., printed. The Marine Products Export Promotion Council, Ernakulam, India. Includes, among others, articles on: "Council's activities--an assessment and prognosis;" "The Effect of prolonged storage in ice on prawn," by A. N. Bose; "Marine turtle fishery of India," by S. T. Chari; "Tuna long line operations in the west coast of India," by P. K. Eapen; "Export of shark fins;" "Exports of dried prawns from India during the years 1962 & 1963;" "Exports of marine products from India during the years 1962-63 & 1963-64;" "Exports of marine products from India during the months January to May 1963 and 1964;" "Exports of shark fins & fish maws from India during the years 1962 & 1963;" and "Exports of dried fish from India during the years 1962 & 1963."

INDIAN OCEAN:

"Le probleme de la peche dans le cadre de l'expédition océanographique internationale dans l'océan Indien" (The fishery problem in the International Indian Ocean Expedition plan), by E. Postal, article, *La Pêche Maritime*, vol. 43, no. 1038, September 1964, pp. 638-645, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

INDUSTRIAL PRODUCTS:

"Preparation of fish concentrates for animals and birds," by A. P. Chernogortsev and V. I. Shenderyuk, article, *Chemical Abstracts*, vol. 60, June 8, 1964, 15064e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

INTERNATIONAL COMMISSIONS:

International Commission for the Northwest Atlantic Fisheries, Statistical Bulletin for the Year 1962, vol. 12, 78 pp., illus., printed, 1964, C\$3. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada. This bulletin is divided into two parts: Part 1 summarizes statistics on fishery landings in the Convention area, 1952-1962; and Part 2 includes statistical tables dealing with the fisheries in 1962. The presentation of the basic statistical data again has been designed to place emphasis on area and month of fishing. Contains a summary of all landings by species group, country, and statistical subdivision; landings of cod, haddock, ocean perch, halibut, and flounder for each type of gear; landings of each species by subarea; and fishing effort and landings by country, gear, and subarea. Member countries include Canada, Denmark, France, Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, U.S.S.R., United Kingdom, and the United States.

IOWA:

Quarterly Biology Reports, January, February, March 1964, vol. 16, no. 1, 61 pp., processed. Biology Sec-

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tion, Fish and Game Division, State Conservation Commission, E. 7th and Court Sts., Des Moines, Iowa. The section on fisheries contains the following articles: "Pleasure boat numbers as compared to fishing boats on several northwest Iowa Lakes, 1961, '62 and '63," by Tom Moen; "A brief preliminary report on commercial channel catfish," by Roger Schoumacker; "A fishery investigation of five Missouri River ox-bow lakes during 1963," by Bill Welker; and "Coralville Reservoir fisheries investigations, 1963, Part II--Limnology and fish populations," by Jim Mayhew.

IRRADIATION PRESERVATION:

"Perishables you can store on the shelf," article, *Business Week*, no. 1832, October 10, 1964, pp. 120, 123-124, illus., printed, single copy 50 cents. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036. Nuclear irradiation is making it possible to keep some foods, particularly meat and fish, longer than ever before--often even without use of refrigeration. Recently the first semicommercial irradiator in the country was dedicated at the U. S. Bureau of Commercial Fisheries' Technological Laboratory in Gloucester, Mass. Fish is a good prospect for irradiation to prevent spoilage since bacteria normally cause fish to decay quickly; irradiation destroys the bacteria. The new irradiator at Gloucester is equipped to irradiate one ton of fish an hour. Bureau of Commercial Fisheries' researchers have been irradiating haddock as well as mackerel and lobster. On ice, the fish will keep for about 10 days; limited radiation treatment makes it possible to extend refrigerated shelf life to 30 days. The fishing industry has a big potential for market expansion, particularly in inland areas, if only its product could be made less perishable.

"Radiation preservation of marine products: U.S.A. E.C. Programme," by E. Machurek, article, *Irradiation des Aliments* (Food Irradiation), vol. 4, April-June 1964, pp. A2-A7, illus., processed, European Information Centre for Food Irradiation, P. O. Box No. 6, GIF-sur-Yvette (S.-et-O.), France. This program is directed to those marine products showing the most promise as evaluated by the Massachusetts Institute of Technology. The original list included soft-shell clams, haddock, clams, shrimp, Pacific crab, and flounder. Recently, freshwater perch and smoked chub have been added. Primary emphasis has been on the determination of process technology and the establishment of wholesomeness and safety. If large-scale tests bear out the very successful laboratory results, it is hoped that, through the U. S. Department of the Interior, the National Fisheries Institute, and others, industry may be induced to attempt commercialization.

"Review of the United States Army irradiated food wholesomeness program," by M. E. MacDowell and N. Raica, article, *Nuclear Science Abstracts*, vol. 17, 1963, 38736, printed. United States Atomic Energy Commission, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

JAPAN:

Bulletin of the Faculty of Fisheries, Nagasaki University, no. 15, December 1963, 117 pp., illus.,

printed in Japanese with English abstracts. The Faculty of Fisheries, Nagasaki University, Nagasaki, Japan. Contains, among others, these articles: "On diethylene glycol succinate monoester as a stationary liquid phase in gas-chromatography of methyl esters of fatty acids and on the chromatographic study of horse-mackerel oil," by Shojiro Miyahara and Yoshiaki Tabata; "On the presence of tyrosinase in the byssus or mucus gland of the bivalves," by Buhei Zenitani and Tadataka Taniguti; "Analysis of fish finder records. III--On a dynamical study of external force on the tuna longline and control of the hook depth," by Keishi Shibata and Shigeaki Yada; "IV--Report on the deep scattering layers and tuna food," by Keishi Shibata.

Bulletin of the Faculty of Fisheries, Nagasaki University, no. 16, March 1964, 138 pp., illus., printed in Japanese with English summary. The entire issue consists of the article: "Ecological studies on marine fouling animals," by Takeshi Kazihara.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, no. 4, April 1964, 79 pp., illus., printed in Japanese and English. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan. Includes, among others, these articles: "Annual variation of longline catch-rate of big-eyed tuna in the eastern Pacific tropical waters," by Jun Nakagome and Hirota Suzuki; "Fundamental studies on the production of alginate acid. II--Examination of the condition of acid treatment; III--On the change of membrane potential of algae by acid treatment," by Yuzo Harada; "Studies on muscle of aquatic animals. XXXII--Species difference in fish actomyosin (Part 2)--Relation between heat-denaturing point and species," by Tadao Ueda, Yutaka Shimizu, and Wataru Simidu; "Biochemical studies on L-Ascorbic acid in aquatic animals. III--Biosynthesis of L-Ascorbic acid by carp," by Shizunori Ikeda and Mamoru Sato; and "Studies on the nutritive values of lipids. XIV--Preliminary experiments of using the fatty acids fraction of sperm whale oil and methyl ester of rice bran oil for animal feed," by Takashi Kaneda and Kimie Arai.

Contributions from the Department of Fisheries and the Fishery Research Laboratory, Kyushu University, no. 9, 1963, 125 pp., illus., printed in Japanese and English, July 1964. Department of Fisheries and Fishery Research Laboratory, Kyushu University, Fukuoka, Japan. Includes, among others, these articles: "Sargassum vegetation growing in the sea around Tsuyazaki, North Kyushu, Japan," by T. Yoshida, T. Sawada, and M. Higaki; "Inactivation of chlortetracycline in muscle tissue and method for its stabilization," by T. Tomiyama and K. Kitahara; "The reactions of fishes to toxic substances. III--The reactions of fishes to hydrogen ion," by S. Ishio; "Studies of the external mucous substance of fishes. VIII--Quantitative analysis of the mucus-polysaccharide from some fishes. 2--Basic and acidic sugar composition," by N. Enomoto, H. Nagatake, and Y. Tomiyasu; "A practical method of detecting boric acid added as preservatives to Kamaboko (fish jelly product)," by N. Enomoto and Y. Tomiyasu; "Lipid oxidation and protein denaturation in freeze-dehydrated fish," by M. Toyomizu, Y. Matsumura, and

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Y. Tomiyasu; "Discoloration of Lyophilized fish," by M. Toyomizu, F. Orita, and Y. Tomiyasu; and "Discoloration of marine animal products. II--Review," by M. Toyomizu and Y. Tomiyasu.

Hokusuishi Geppo (Hokkaido Fisheries Experimental Station Monthly), vol. 21, no. 9, September 1964, 48 pp., printed in Japanese. Hokkaido Fisheries Experimental Station, 238-banchi, Hamanaka-cho, Yoichi, Hokkaido, Japan. Includes, among others, these articles: "Eastern Bering Sea herring; plans concerning the reproduction of White Sea herring;" and "Fishing gear and fishing methods employed in the Soya region," by T. Takahashi and T. Fukuda.

--Lorry M. Nakatsu

Japan's Fishery Industry, 19 pp., illus., printed, April 1964. Japan Fisheries Association, Tokyo, Japan. Discusses briefly recent development of the Japanese fisheries industries; types of fisheries--whaling, tuna, salmon, factoryship crab, saury lift-net, purse-seine, squid angling, and coastal; aquiculture--pearl, oyster, fresh-water fish, and salt-water fish; conservation of marine resources--survey and research, regulations on fisheries, and expansion of culture activities; improvement of fisheries technique; fishing vessels and ports; and fishermen's organizations.

Japan's World Success in Fishing, by Georg Borgstrom, 312 pp., illus., printed, 1964, £2 15s. plus postage 2s. 6d. (\$8.25). Fishing News (Books) Ltd., 110 Fleet St., London EC4, England. Food from the sea is essential in order for Japan to feed its population of 90 million. In addition, Japan has developed an important export business for fishery products and that trade is important as a source of earning foreign currency to pay for her imports. There has been a great deal written about Japan's efforts and fisheries, but now this book brings the story together into one place. The whole field of Japanese fishery activities from farming fish in their inland sea to fishing by their large fleets of mother-ships and factoryships all over the world is covered in this book. The author expertly describes the background of Japan's amazing success in fishing all the oceans of the world.

Discussed is the over-all master plan of governmental guidance implemented practically by private enterprise. Included in the plan was the building of mothership fleets, supported by attendant catchers, factoryships for processing fishery products in distant waters, refrigerated carrier vessels for transportation to domestic and foreign markets, the erection of shipbuilding yards, net-making factories and food-processing equipment, and the establishment of bases and links with countries overseas.

The extensiveness of Japan's marine fishing fleet is easily realized when one considers that she has over 188,000 vessels engaged in marine fishing with a gross tonnage of 1,609,709. Her foreign ramifications are revealed by the fact that 200 of her vessels are foreign-based, and overseas fishery enterprises are either planned or operating in over 50 countries. Also, 3 million people directly depend upon Japan's fishing industry for their livelihood. Up to a year or two ago, Japan was the leading producer of fishery products in the world.

In his introduction the author establishes the theme that "the world is engaged in a global war for food and that the oceans are in the front field of this great battle." Revealed by the author are the agreements and disagreements Japan has had with the Soviets since the beginning of the 20th century. Chapters in the book deal with the main features of Japanese fisheries, the processing industry, specialized processing, seaweeds, the international and domestic markets, and regional and global fisheries. One chapter is devoted to the Tsushima long-term plan which, according to the author, was primarily responsible for the rapid development of Japanese fishery enterprises and world-wide exploitation of the oceans. There are chapters dealing with the development of motherships and floating factories; the incentive to increase the fishery catch from the Pacific, the Indo-Pacific area, the Atlantic, the Mediterranean, the Caribbean; the exploitation of whaling and sealing; exploratory fishing; education and research; special international commissions; present international tensions; and global aspects. Covered are postwar trends and technical advances made in the vessels used and the equipment and gear with which they are fitted; also some information about Japan's three largest fishing firms with interests in every segment of the fishery industries. He shows catches and landings of tuna in Japan proper and overseas, and discusses the profitability of motherships as compared with overseas bases. In the last chapter the author makes a number of pertinent observations, discusses the economics, and comments on the relationship between man and the resources of the sea.

Photographs, maps, and an adequate index add to the book's usefulness. Among the many sources the author used to obtain information, he cites the U. S. Fishery Market News and Commercial Fisheries Review. Anyone interested in any aspect of the world's fisheries and Japan's, in particular, will find this book enlightening and indispensable. Those interested in foreign trade will find much of value in it.

--Joseph Pileggi

New Fishing Boat in Japan, 2nd Edition, 130 pp., illus., printed in Japanese with English table of contents, August 1964. The Fishing Boat Association of Japan, Tokyo, Japan. Presents information on each steel and wooden fishing vessel classified as fisheries training boat, fisheries research boat, oceanographic research vessel, fisheries inspection boat, refrigerated fish carrier, refrigerated fish factoryship, stern trawler, small trawler, tuna long-line boat mothership, tuna long-line fishing boat, skipjack pole and line fishing boat, purse seiner fish carrier, salmon drifter, and cod long-line fishing boat. Includes a photograph of each vessel.

Technical Report of Fishing Boat, No. 18, printed in Japanese with English abstracts. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan.

JORDAN:

Foreign Trade Regulations of Jordan, by Jackson B. Hearn, OBR 64-115, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For

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sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Jordan's trade controls are applied largely for balance of payments and revenue purposes and are designed to adjust imports to the market requirements of local industry. In addition to trade policy, the report discusses import tariff system, documentation, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, Jordan's export controls, United States foreign trade controls, and Government representation between Jordan and the United States.

LATIN AMERICAN FREE TRADE ASSOCIATION:

"LAFTA 4th annual session now considering further 9-member tariff reductions," article, *International Commerce*, vol. 70, no. 43, October 26, 1964, p. 15, printed, single copy 35 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses the Fourth Annual Session of the Conference of the Latin American Free Trade Association (LAFTA), opening October 20, 1964; and meeting to negotiate further tariff cuts among the 9-member organization and to determine certain policy questions. The 3 previous conference meetings resulted in some 8,200 tariff concessions. Under the Treaty of Montevideo of 1960, which established the LAFTA organization, members obligated themselves to lower trade barriers by 8 percent in relation to barriers to third countries during each annual meeting on the national schedules. The Secretariat reported that there was tentative agreement on a list of items accounting for about 26 percent of intra-LAFTA trade.

LOUISIANA:

10th Biennial Report, 1962-63, 211 pp., printed, 1964. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

MALAWI:

Annual Report of the Department of Game, Fish and Tsetse Control for the Year 1962, Part I, 55 pp., processed, 1964, 4s. (about 55 U. S. cents), Government Printer, Zomba, Malawi. A report by the newly-independent Republic of Malawi, formerly the British dependency of Nyasaland, in southern Africa. The section on fisheries discusses the state of the fish stocks, large-scale fishery under license, small-scale fishery not subject to license, the fish trade, development work, training and promotion, and experimental work. Also covers fisheries research, trout fishing, and fish farming. Included are tables showing landings by gear and by species, fishery products exports, nets used in the subsistence fishery, average catch per haul, catch of more important species in Lake Nyasa, and trout landings.

MARINATED FISH:

"Lactic acid bacteria in fish marinades," by V. Meyer, article, *Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene*, vol. 184, 1962, pp. 296-301, printed in German, Gustav Fischer Verlag, Villengang 2, Jena, Federal Republic of Germany.

MARINE FISHERIES:

Ocean Fisheries, Pre-Publication Issue, July 1964, 32 pp., illus., printed, Ocean Fisheries, Circulation Department, 500 Howard St., San Francisco, Calif. 94105. The pilot issue of a new periodical which will commence quarterly publication in 1965 and which will seek to report the advancing, expanding fisheries with notable potential throughout the world. This issue contains these articles: "Coastal fisheries jurisdiction and resources of the continental shelf," by D. F. Miller; "Prodigious Peru--4-month fish meal output far ahead of 1963 record," by Charles S. Sinclair; "Iceland--world's first purse seiner with active rudder and bow-thruster," by W. Nitter Egeaen; "Mexico--moves mightily to reap the sea;" "Japan--Kanagawa freezer designed to compete for tuna trade," by Kenji Sakai; "1964 international notes of a fishery consultant," by Borti Petrich; "Strait of Magellan--centolla crab freezing promising," by Dietrich Angerman; "Australia--1963-64 catch of tuna sets up a new record," by R. M. Fowler; and "City of Tacoma--last word in tuna seiners."

MARINE FOULING:

Marine Fouling and Its Prevention, Woods Hole Oceanographic Institution Contribution No. 580, 396 pp., illus., printed, 1952, \$10. United States Naval Institute, Annapolis, Md. This book is divided into three parts. Part I, problems of fouling, covers the effects of fouling, and ship resistance. Part II, biology of fouling, contains chapters on the fouling community, temporal sequences and biotic successions, the seasonal sequence, quantitative aspects of fouling, geographical distribution, relations to local environments, the principal fouling organisms, and species recorded from fouling. Part III, prevention of fouling, includes chapters on the history of prevention of fouling, the invention of protective devices, factors influencing the attachment and adherence of fouling organisms, the prevention of fouling with toxics, the physical chemistry of compounds of copper and mercury and their interactions with sea water, and mechanisms of release of toxics from paints. Also includes chapters on the dissolution of the matrix and its ingredients, characteristics of antifouling coatings, the design of antifouling paints, the testing of antifouling paints, the fouling of metallic surfaces, and interaction of antifouling paints and steel.

MASSACHUSETTS:

Annual Report, Fiscal Year July 1, 1962-June 30, 1963, 74 pp., illus., processed, September 1, 1963, 22 cents. Division of Marine Fisheries, Department of Natural Resources, 15 Ashburton Pl., Boston 9, Mass.

MAURITANIA:

"La Mauritanie n'est pas le Perou" (Mauritania is not Peru), by Georges Freris, article, *France Pêche*, no. 87, September 1964, pp. 48-51, illus., printed in French, single copy 2.5F (about 50 U. S. cents), France Pêche, Boite Postale, Lorient, France.

MENHADEN:

Some Peculiarities in Menhaden Morphology - BREVO-ORTIA TYRANUS (Latrobe), by E. E. Gusev, 4 pp., processed, August 1964. (Translated from the Russian, *Contributions to Commercial Fisheries Research of the Arctic Basin*, no. 2, 1964, pp. 13-16.) Marine Biological Laboratory, Woods Hole, Mass.

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MEXICO:

The following publications, printed in Spanish, are available from Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

Algunos Aspectos Biologicos del Pescado Blanco del Lago de Patzcuaro, Mich. (CHIROSTOMA ESTOR Jordan, 1879) (Some Biological Aspects of the White Fish of Patzcuaro Lake, Mich.--*Chirostoma estor* Jordan, 1879), by Aurelio Solorzano Preciado, 12 pp., illus., 1963.

Breve Reseña sobre las Principales Artes de Pesca Usadas en Mexico (Brief Review of the Principal Methods of Fishing Used in Mexico), by Pedro Mercado Sanchez, 79 pp., illus., 1959.

Contribucion al Conocimiento de la Biología del Charal Prieto del Lago de Patzcuaro, Mich. (CHIROSTOMA BARTONI Jordan y Evermann, 1896) (Contribution to the Knowledge of the Biology of the White Fish of Patzcuaro Lake, Mich.--*Chirostoma bartoni* Jordan and Evermann, 1896), by Aurelio Solorzano Preciado, 70 pp., illus., 1961.

Investigaciones Ictiologicas en la Costa de Chiapas--Lista de Peces Colectados en las Capturas Camaroneras (Agosto y Septiembre de 1959 y Abril, Mayo y Junio de 1960) (Ichthyological Investigations along the Chiapas Coast--List of Fish Collected in the Shrimp Landings--August and September 1959 and April, May, and June 1960), by Ernesto Ramirez H., Guillermo Carrillo, and Daniel Lluch B., 15 pp., 1964.

Los Peces del Valle de Mexico (The Fishes of the Valley of Mexico), by J. Alvarez del Villar and Leopoldo Navarro G., 62 pp., illus.

The following publications, all part of the series: "Trabajos de Divulgacion," processed in Spanish, are available free from Direccion General de Pesca, Secretaria de Industria y Comercio, Mexico, D. F.

El Problema Pesquero Nacional (The National Fishery Problem), by Rodolfo Ramirez Granados, vol. I, no. 3, 45 pp., June 1959 (reprinted July 1963).

Extracto sobre la Biología de los Camarones del Genero PENAUEUS en Aguas Mexicanas (Summary of the Biology of the Shrimp of the Genus *Penaeus* in Mexican Waters), by Pedro Mercado Sanchez, vol. I, no. 5, 19 pp., illus., August 1959 (reprinted May 1963).

El Aprovechamiento del Pescado, Recurso Olvidado (Utilization of the Fishery, Forgotten Resource), by Juan Manuel Tibon, vol. I, no. 6, 15 pp., September 1959 (reprinted July 1963).

Las Pruebas Químicas en la Determinación de la Frescura o Calidad en la Carne de Pescado (A Chemical Method for Determining the Freshness or Quality of Fish), by Manuel Calvo Mendoza, vol. II, no. 11, 9 pp., illus., December 1960 (reprinted August 1963).

Clave para los Scienidos (Sciaenidae: Curvinas, Berugatas, etc.) del Pacifico Oriental (Key to the

Sciaenids--Sciaenidae: Croaker or Corbina, Berugate, etc.--of the Eastern Pacific), by J. D. McPhail, vol. II, no. 12, 28 pp., illus., December 1960, reprinted December 1963, (Translated from the English, Museum Contribution No. 2, Institute of Fisheries, University of British Columbia, Vancouver, Canada, November 1958.)

Posibilidades Ostrícolas de Mexico (Possibilities of Oyster Culture in Mexico), by Maria Luisa Sevilla, vol. II, no. 13, 14 pp., December 1960 (reprinted July 1963).

Guion para el Estudio de los Recursos Pesqueros de Mexico (Guide to the Study of the Fishery Resources of Mexico), by Maria Luisa Sevilla, vol. III, no. 22, 26 pp., illus., January 1962.

Contribucion al Estudio del Pulpo (OCTOPUS VULGARIS Lamarck) de la Sonda de Campeche (Contribution to the Study of the Octopus--*Octopus vulgaris* Lamarck--of Campeche Sound), by Manuel J. Solis Ramirez, vol. III, no. 24, 33 pp., illus., April 1962.

Plan de Trabajo a Desarrollar por las Estaciones del Instituto Nacional de Investigaciones Biológico-Pesqueras (Work Plan for Improving the Status of the National Institute of Fishery Biological Investigations), by Rodolfo Ramirez G., Hector Chapa Saldana, and Mauro Cadenas F., vol. IV, no. 32, 31 pp., September 1962.

Clave Dicotómica para la Determinación de los Ordenes de Crustaceos (Dichotomous Key for the Determination of the Orders of Crustaceans), by Federico Bonet Marco, vol. IV, no. 39, 87 pp., January 1963 (reprinted November 1963).

Principales Lugares para Practicar la Pesca Deportiva en Aguas Dulces, Salobres y Maritimas de la Republica Mexicana (Principal Places for Sport Fishing in Fresh, Brackish, and Salt Waters of the Republic of Mexico), vol. IV, no. 40, 13 pp., January 1963.

Langostas (Crustacea Decapoda) Identificación, Distribución, Comercio (Spiny Lobster--Crustacea Decapoda--Identification, Distribution, and Trade), by Fenner A. Chace Jr. and William H. Dumont, vol. V, no. 46, 42 pp., March 1963.

Tecnología Aplicada en la Elaboración de Alimentos a Partir de Material Marino (Technology Applied to the Manufacture of Food from Marine Products), by Carlos E. Perez Bacera, vol. V, no. 47, 13 pp., March 1963.

Aspectos Generales sobre las Ranas y su Cultivo (General Observations on Frogs and Their Cultivation), by Federico Aguilar Ibarra, vol. V, no. 49, 23 pp., April 1963.

Jamon y Salchicha de Pescado (Fish Ham and Sausage), by K. Ishiguro, vol. V, no. 50, 26 pp., illus., May 1963. (Translated from the Japanese, Chiba Fishing Net Co., Ltd., Tokyo, Japan.)

Claves de Identificación para Cangrejos Cancroideos de America (Key to Identification of Cancroid Crabs of America), by Mary J. Rathbun, vol. VI, no. 51, 86 pp., illus., May 1963. (Translated from the English,

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The Cancroid Crabs of America of the Families Euryalidae, Portunidae, Atelecyclidae, Cancridae and Xanthidae, Bulletin No. 152, U. S. National Museum, Washington, D. C., 1930.)

Notas sobre Algunos Peces de Importancia Comercial en los Estados de Tamaulipas y Veracruz (Notes on Some Fish of Commercial Importance in the States of Tamaulipas and Veracruz), by Ernesto Ramirez H., vol. VI, no. 52, 13 pp., May 1963.

Las Algas Marinas como Recurso Natural Explotable. La Necesidad de Realizar en Mexico Estudios Sistemáticos y Bioquímicos de Este Recurso (Marine Algae as a Natural Exploitable Resource. The Need to Conduct in Mexico Systematic and Biochemical Studies of this Resource), by Sergio A. Guzman del Proo, vol. VI, no. 53, 10 pp., May 1963.

Anteproyecto para el Estudio de las Posibilidades Ostrícolas en el Estado de Nayarit (Preliminary Plans for the Study of the Possibilities of Oyster Culture in the State of Nayarit), by Federico Aguilar Ibarra, vol. VI, no. 55, 12 pp., May 1963.

Prospeccion Acerca de las Tortugas Marinas de Mexico (Prospects with Regard to the Marine Turtles of Mexico), by Aurelio Solorzano P., vol. VI, no. 54, 14 pp., illus., May 1963.

Difusion Biológico Pesquera y Conservación (Diffusion of Fishery Biology and Conservation), by Mauro Cardenas Figueroa, vol. VI, no. 56, 21 pp., May 1963.

Notas sobre las Investigaciones del Camaron en el Noroeste y los Resultados Prácticos Obtenidos (Notes on the Investigations of the Shrimp of the Northeast and the Practical Results Obtained), by Federico Aguilar I., vol. VI, no. 57, 5 pp., May 1963.

Asesoría Técnica y Científica para el Desarrollo de las Actividades Pesqueras en Nayarit (Technical and Scientific Advice for the Development of Fishing Activities in Nayarit), by Federico Aguilar Ibarra, vol. VI, no. 58, 52 pp., illus., May 1963.

Extractos de Tecnología Pesquera en Sistema de Tarjetas (Fishery Technology Abstract Card System), by M. E. Stansby, K. L. Osterhaug, and F. Bruce Sanford, vol. VI, no. 59, 41 pp., June 1963. (Translated from English, Fishery Leaflet 232, U. S. Fish and Wildlife Service, Washington, D. C., July 1956.)

El Carrete Mecánico de Mano y la Ecosonda en la Pesca del Huachinango (The Mechanical Hand Reel and Sonar in the Huachinango Fishery), by Dilio Fuentes Castellanos, vol. VI, no. 60, 20 pp., illus., May 1963.

La Pesquería de Langostas del Pacífico Mexicano (The Spiny Lobster Fishery of the Mexican Pacific), by Hector Chapa Saldana, vol. VII, no. 61, 17 pp., illus., June 1963.

Fichas Bibliográficas en Orden Numérico de la Serie Trabajos de Divulgación, Comprende: del Número 1, al Número 80 (Bibliographic File Cards in Numerical Order of the Series "Trabajos de Divulgación" Covering Number 1 through Number 80), Com-

piled by Fidel Cano Elias, vol. VIII, no. 79, 9 pp., December 16, 1963.

Índice Alfabético de Materias de la Serie Trabajos de Divulgación Comprende del Número 1, al Número 80 (Alphabetical Subject Index of the Series "Trabajos de Divulgación" Covering Number 1 through Number 80), compiled by Fidel Cano Elias, vol. VIII, no. 80, 12 pp., December 17, 1963.

MINK RATIONS:

"Trials with different amounts of Icelandic cod waste (from fillets and trimmings) in feeds for young mink," by G. Jorgensen, article, *Dansk Pelsdyravl*, vol. 24, 1961, pp. 164-166, printed in Danish. *Dansk Pelsdyravl*, Sdeasy 8, Copenhagen, Denmark.

"Trials with redfish (*Sebastes marinus*) for young mink," by G. Jorgensen, article, *Dansk Pelsdyravl*, vol. 25, 1962, pp. 271-274, printed in Danish.

MOLLUSCS:

Distribution and Variation in Abundance of Benthic Molluscs in the Konfederatka Pool at Wyszogród (Rozmieszczenie i Dynamika Liczebności Miecza-kow Dennyh na Lasze Wislanej Konfederatka Pod Wyszotrodem), by Anna Stanczykowska, *OTS* 63-11400, 13 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, *Ekologia Polska*, vol. 8, no. 7, 1960, pp. 155-168.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

NATURAL RESOURCES:

World Prospectus for Natural Resources--Some Projections of Demand and Indicators of Supply to the Year 2000, by Joseph L. Fisher and Neal Potter, 78 pp., illus., printed, 1964, \$1.50. The Johns Hopkins Press, Baltimore, Md. 21218. In recent times the population explosion in the underdeveloped countries and very rapid increases in most of the more developed nations have led to a reawakening of concern about the capacity of the natural environment and its resources to sustain desired rates of economic growth. Science, technology, and the economic adaptation of their accomplishments are seen as pitted against the sheer increase of population, which in many less developed areas is now running at 3 percent a year. Continuation of this rate would mean a doubling every 24 years. Clearly the population problem is not simply one of numbers of people, but also of natural resources and how they are used. Information is presented on the question of resource adequacy, the case of the United States, world trends in resources, projections of resource demands, and reserves and alternate supply possibilities. The contribution which the world's fisheries can make to better diets has never been adequately explored, but it is undoubtedly large, state the authors.

NEW ZEALAND:

Report of the Marine Department for the Year Ended 31 March 1964, 53 pp., printed, May 7, 1964, 2s. (about 28 U. S. cents). R. E. Owen, Government Printer, Wellington, New Zealand. A large portion of this report is devoted to New Zealand's fisheries during 1963. Included is information on total quantity and value of fishery products marketed in calendar year 1963, spiny lobsters, fishing vessels and per-

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sonnel, landings by species, methods of capture, landings by ports, exports and imports of fishery products, big-game fishing, fish-liver oil, and whaling. Also includes information on rock oysters, dredged oyster, whitebait fishing--1963 season, mussels, angling licenses, research and investigation, Fishing Industry Advisory Council, Freshwater Fisheries Advisory Council, Fishing Industry Board, and legislation pertaining to fisheries.

NORTH KOREA:

Economic Report on North Korea, No. 126 (For Establishment of Scientific System of Fisheries, TT: 64-41357), 14 pp., processed, August 24, 1964, \$1. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

NORWAY:

"Rogaland and the fisheries;" "Canned fish, a Stavanger speciality;" "Modernisation in canning;" "Canning machines;" "Dies for cans;" "Canning plant;" "Fish meal and oil plants," articles, Norway Exports, no. 3, Autumn 1964, pp. 41-43, illus., printed, Export Council of Norway, H. Heyerdahls Gate 1, Oslo 1, Norway. Discusses the fisheries of Rogaland in southwestern Norway. Fishermen in this area participate in the winter herring fishery, the North Sea trawl fishery, and the herring fishery off Iceland. Also important to the area are a canning laboratory and canning school. Included is information on the fish canning industry at Stavanger, where the industry commenced in 1841; the largest canning plant in Norway; a manufacturer of canning machines; a firm producing dies for the manufacture of aluminum and tinplate cans; a producer and exporter of fish canning equipment; and a fish meal and oil plant manufacturer.

NUTRITION:

Ocean Science and Human Protein Malnutrition Problems in Middle Africa, by Wilbert McLeod Chapman, 35 pp., printed, 1964. Institute of International Affairs, University of California, Berkeley, Calif.

OCEANOGRAPHY:

Geo Marine Technology, vol. 1, no. 1, November 1964, 62 pp., illus., printed, INTEL, Inc., 739 National Press Bldg., Washington, D. C. The first issue of a monthly technical periodical for ocean scientists. Intended principally as an effective medium of information exchange among those concerned with designing, engineering, and deploying systems in the total ocean environment. Contains the following articles: "Publishers note - What is GMT?" by Seabrook Hull; "Forum of the Institute of the Bent Trident"; "Ocean mining"; "Abstract - Methods of operation with anchored buoy stations"; "U.S.C. & G.S.," by E. John Long; "AGOR & post-AGOR," and "Space oceanography," by Seabrook Hull; "Search for materials data," by Walter F. Bohlen; "On Station (news)," Also an "Engineering reference file: Sea state chart - David Taylor Model Basin; Data sheet ads - cumulative index."

"Revival of oceanography in Germany," by Victor K. McElheny, article, Science, vol. 146, no. 3640, October 2, 1964, pp. 45-48, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

Selected Articles on Oceanography, OTS 63-11107,

50 pp., illus., processed, 1964, 50 cents. (Translated from the Russian.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Contains articles on: "Oceanographic guideposts in reconnoitering for fish in marine fisheries," by M. V. Fedosov; "Relationship between the tangential wind stress over an agitated water surface and the velocity of wind," by R. N. Ivanov; "Latest results of hydrological study of the Kuroshio current from the viewpoint of fishery oceanology," by V. V. Leont'ev; "Role of vertical stability of layers in development of deep-sea upwelling phenomena," by Yu. G. Ryzhkov; "Contribution to the method of the sorting of benthic hydrobiological samples," by S. N. Torsukov; "Apparatus for determination of the coefficient of attenuation of directed light in the sea," by V. A. Timofeeva; "A simplified method for computing the heat balance of the sea surface," by Ya. A. Tyutnev; and "Interferometric determination of the salinity of sea water," by Yu. A. Vel'mozhnaya.

OCTOPUS:

"El extraordinario pulpo vulgar" (The extraordinary common octopus), by Blas Venegas, article, Iberica Actualidad Científica, vol. 42, nos. 25-26, July-August 1964, pp. 291-294, illus., printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Iberica Actualidad Científica, Apartado 759, Palau, 3, Barcelona 2, Spain.

O.E.C.D.:

"Financial support to the fishing industries," article, The OECD Observer, no. 12, September 1964, pp. 36-37, illus., printed, single copy 50 cents. The Organisation for Economic Co-Operation and Development, Publications Office, 2, rue Andre-Pascal, Paris (16^e), France. Discusses a survey carried out recently by the OECD Fisheries Committee of the various systems of aid to fishing industries practiced by member countries--Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. It considered whether they were acceptable, having regard not only to increased trade in sea products but also the need to maintain healthy competition between member country industries. It concluded by specifically recommending that any financial support considered to have harmful effects should be gradually reduced and eventually discontinued.

"L'O.C.D.E. demande qu'il soit mis fin à la plupart des aides financières accordées aux industries de la pêche maritime dans les pays membres" (The O.E.C.D. requests an end for most of the financial aids granted to marine fisheries of the member countries), article, La Pêche Maritime, vol. 43, no. 1038, September 1964, pp. 631-637, printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

OYSTERS:

Comments on the Occurrence and Nature of Certain Types of Coloration in Oysters, by G. Francis Beaven, Reference No. 64-4, 5 pp., processed, January 30, 1964. Natural Resources Institute, the University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. The presence or development of any color

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in shucked oysters other than that which is considered a normal oyster gray-white often arouses concern in the industry and may cause consumer rejection of the product. Few instances of color development can be prevented; most are a natural occurrence; and of those studied the quality of the oysters seldom is adversely affected. In order to reduce the instances of alarm expressed by those unfamiliar with normal development of color, this summary briefly describes instances of colored oysters or oyster liquor and the apparent cause where studies of the condition have been made. Everyone should recognize that many marked color differences among shellfish are normal, do not harm the animal or its value as food, and should not be an occasion of uncalled for alarm.

Crisis Ostricolas en Mexico y su Recuperacion (Oyster Culture Crisis in Mexico and Its Recovery), by Fernando de Buen, 46 pp., illus., printed in Spanish, 1957. Direccion General de Pesca e Industrias Conexas, Secretaria de Marina, Mexico, D. F.

"Observations on the length-weight relationship of pearl oysters," by K. Alagaraja, article, Marine Biological Association of India Journal, vol. 4, no. 2, 1962, pp. 198-205, printed. Marine Biological Association of India, Marine Fisheries, P. O., Ramanathapuram Dist., South India.

"Preliminary observations on the growth of spat of the oyster *Crassostrea gryphoides* (Schlotheim)," by V. S. Durve and D. V. Bal, article, Marine Biological Association of India Journal, vol. 4, no. 2, 1962, pp. 206-213, illus., printed.

PACIFIC OCEAN:

Differentiation of Geographical Zones of Central Pacific (Scope and Basic Methods of Geographical Zonation) (Kharakteristika Geograficheskikh Zon Tsentral'noi Chasti Tikhogo Okeana--k Postanovke Problemy i Metoda Resheniya), by V. G. Bogorov, OTS 64-11100, 5 pp., processed, 1964, 50 cents. (Translated from the Russian, Biologiya Morya, Trudy Okeanograficheskoi Komissii Akademii Nauk SSSR, vol. 10, no. 4, 1960, pp. 3-7. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

PELAGIC FISH:

Review of Canadian Fishery and Research on Large Pelagic Fish in the ICNAF Area in 1963, by S. N. Tibbo, Manuscript Report Series (Biological) No. 792, 5 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

PERSIAN GULF:

Shrimp, Pearl and Sardines of the Persian Gulf, by Ismail Rostami, Publication No. 9, 68 pp., illus., printed in Persian and English, August 1964, Ahwaz Agricultural College, Molla Sani, Iran. Contains three articles on unrelated subjects. "A brief study on biology and the economic importance of shrimp," discusses the most important species (*Penaeus setiferus*, *P. aztecus*, and *P. duorarum*); hydrology of the Persian Gulf; gear used (otter-trawls, stake fences, nets, and shore seines); development of the fishery by Iranian, Kuwaiti, and Pakistani firms;

quantity and value of landings; and need for further exploratory fishing. "Pearl and its exploitation in the Persian Gulf," covers pearl formation and characteristics; mollusks producing pearls (*Meleagrina margaritifera*, *M. vulgaris*, and *M. martensi*); natural resources and control of their exploitation; fishing methods; pearl fishing regions (Red Sea, Persian Gulf, Ceylon, Madagascar, Japan, Australia, and Central America) and seasons; Japanese method of pearl culture; artificial pearls; and fisheries in the Persian Gulf. "Biology and fishing of sardines of southern Iran," presents information on species found in southern Iranian waters (*Sardinella perforata*, *S. fimbriata*, *S. sindensis*, *S. melanura*, and *S. sirm*); size, weight, and oil content; fishing grounds; utilization of catch; influence of temperature on fishing; fluctuation of populations; and landings (about 12,000 metric tons annually). Also included in the latter article are data on size and weight of sardines by sex, distribution of catch by districts, catch utilization, sea surface temperatures and percentage of catch, and delivery of raw sardines to the cannery.

PERU:

Foreign Trade Regulations of Peru, by Bruce B. Sever, OBR 64-99, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Peru's trade policy is designed chiefly to stimulate national economic development and regional economic integration, to raise revenue for operating the Government, and to encourage international trade. The report discusses Peru's import tariff system; taxes; documentation and fees; labeling, marking, and packing; and special customs provisions. Also covers non-tariff import controls, Peru's export controls, United States trade controls, and Government representation between the two countries.

PESTICIDES:

"Herbicides residue in seafood. Determination of butoxyethanol ester of 2, 4-dichlorophenoxyacetic acid in shellfish and fish," by J. E. Coakley, J. E. Campbell, and E. F. McFarren, article, Journal of Agricultural and Food Chemistry, vol. 12, May-June 1964, pp. 262-265, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

The Identification and Measurement of Chlorinated Hydrocarbon Pesticides in Surface Waters, by A. W. Breidenbach and others, Public Health Service Publication No. 1241, 119 pp., illus., processed, September 1964. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.

"Pesticides get tangled in net of dead fish," article, Chemical Engineering, vol. 71, June 22, 1964, pp. 82, 84, 86, printed. McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York, N. Y. 10036.

Review of the Persistent Organochlorine Pesticides, Report by the Advisory Committee on Poisonous Substances Used in Agriculture and Food Storage, 67 pp., printed, 1964. Sales Section, British Information Services, 845 Third Ave., New York, N. Y., 10022.

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"Toxic effect of DDT on fishes," by D. S. Mathur, article, 31st Annual Session of the National Academy of Sciences of India, Dehra Dun, 1962, p. 76, printed, National Academy of Sciences of India, Bangalore, India.

PLAICE:

"Red blood values in the plaice (*Pleuronectes platessa*)," by A. Preston, article, *Chemical Abstracts*, vol. 58, March 4, 1963, 4844a, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

POLAND:

"Landings in fishing harbours," article, *Polish Maritime News*, vol. 7, no. 73, September 1964, p. 14, printed, Polish Chamber of Foreign Trade, Maritime Branch, ul. Pulaskiego 6, Gdynia, Poland. In 1963, 209,691 tons of fish were landed in Poland, of which 161,958 tons were landed at the chief fishing ports. Since 1961, there has been an increase in frozen fish, cod and ocean perch fillets, fish meal, and cod-liver oil in the landings. In the past 4 years the number of new trawlers at the ports listed increased; in 1963 Gdynia had 7 factory trawlers.

1000 Lat Naszego Rybolowstwa (1,000 Years of Our Fisheries), by Andrzej Ropelewski, 160 pp., illus., printed in Polish, 1963, Wydawnictwo Morskie, Gdynia, Poland.

Selected Articles, OTS 63-11401, 9 pp., processed, 1964, 50 cents. (Translated from the Polish, *Wiedomosci Parazytologiczne*, vol. 5, nos. 405, 1959, pp. 459-462; 463-465; 467-468.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Includes the following articles: "Parasitological problems in Polish fishery," by E. Grabda and J. Grabda; "Discussion at the session of the Fishery Parasitology Section;" and "Summary of the discussion at the meeting of the Section of General and Fishery Parasitology."

POLLUTION:

Further Studies on the Introduced Asiatic Clam (*COR-BICULA*) in Tennessee, by Ralph M. Sinclair and Billy G. Isom, 82 pp., illus., processed, November 1963, distribution limited, State of Tennessee Stream Pollution Control Board, Cordell Hull Bldg., Nashville, Tenn. 37219.

"The pollution of water by detergents," article, *The OECD Observer*, no. 12, September 1964, pp. 38-39, illus., printed, single copy 50 cents. The Organization for Economic Co-Operation and Development, Publications Office, 2, rue Andre-Pascal, Paris, (16^e), France.

The Toxicity to Fish of Mixtures of Poisons. I--Copper-Ammonia and Zinc-Phenol Mixtures, by D. W. M. Herbert, Reprint No. 447, 6 pp., printed, 1964, (Reprinted from *Annals of Applied Biology*.) Water Pollution Research Laboratory, Stevenage, Hertfordshire, England.

PORTUGAL:

"Relatório do Gremio dos Industriais de Conservas de Peixe do Centro" (Report of the Society of Central Fish Canneries), article, *Conservas de Peixe*, vol. 19,

no. 222, September 1964, pp. 17-19, 21, 23-24, printed in Portuguese, Sociedade de Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

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"Effect of fish meal from various sources on the growth of broiler chickens," by R. Fangauf, H. Vogt, and W. Penner, article, *Chemical Abstracts*, vol. 59, November 11, 1963, 11964g, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Influence of dietary menhaden oil on growth rate and tissue fatty acids of the chick," by Hardy M. Edwards, Jr. and J. E. Marion, article, *Journal of Nutrition*, vol. 81, October 1963, pp. 123-130, printed, American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

"Methionine supplementation of practical broiler rations. I--The value of added methionine in diets of varying fishmeal levels; II--The value of added methionine in chick starter rations," by S. Bornstein and Bionka Lipstein, articles, *British Poultry Science*, vol. 5, May 1964, pp. 167-186, printed, Oliver and Boyd, Ltd., Tweeddale Court, 14 High St., Edinburgh 1, Scotland.

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Preservation of Fish, Torry Miscellaneous Paper No. 3, 7 pp., printed, 1959, Torry Research Station, Abbey Rd., Aberdeen, Scotland.

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"Essential amino acids, tyrosine and cystine, content of purified proteins of Bombay fish," by S. R. Mankikar and K. Sohoni, article, *Journal of the University of Bombay, Physical Science*, vol. 29, pts. 3 and 5 (nos. 48-49), 1960-61, pp. 82-85, printed, University of Bombay, Fort Bombay, India.

"Influence of frying on the biological value of a fish protein," by J. A. Lague, O. Moreiras-Varela, and G. Varila, article, *Anales de Bromatologia*, vol. 15, 1963, pp. 179-185, printed in Spanish, Sociedad Espanola de Bromatologia, Ciudad Universitaria (Edificio Facultad de Farmacia), Madrid, Spain.

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"Frozen fish quality at consumer level," by W. J. Dyer, article, *Canadian Fisherman*, vol. 49, no. 6, 1962, pp. 62-63, 65, printed, National Business Publications Ltd., Gardenvale, Que., Canada.

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article, Archiv für Lebensmittelhygiene Insbesondere für Fleisch, Fisch, und Milchhygiene, vol. 13, 1962, pp. 90-91, printed in German. Verlag M. & H. Schaper, Grazer Strasse 20, Hannover, Federal Republic of Germany.

"A new electronic rapid method for determining freshness of seafish," by C. Henning, article, Zeitschrift für Lebensmittel-Untersuchung und -Forschung, vol. 119, no. 6, 1963, pp. 461-477, printed in German. J. F. Bergmann, Leopoldstrasse 175, Munich 23, Federal Republic of Germany.

Nota sobre Provas de Gustação para a determinação de qualidade de peixes cozidas (Note on Taste Tests for the Determination of Quality in Baked Fish), by Ko Watanabe, Contribuições Avulsas do Instituto Oceanográfico, Tecnologia No. 4, 12 pp., printed in Portuguese with English summary, 1962. Instituto Oceanográfico, São Paulo, Brazil.

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"Pasteurization of fish by ionising radiation. A study of feasibility in the United Kingdom," by D. N. Rhodes, article, Irradiation des Aliments (Food Irradiation), vol. 4, no. 4, April-June 1964, pp. A8-A22, illus., processed. European Information Centre for Food Irradiation, P. O. Box No. 6, GIF-sur-Yvette (S.-et-O), France. It has been established on an experimental scale that packaged and irradiated fillets from 4-day-old fish will remain in first-class condition for between 10 and 20 days under the conditions likely to obtain in commercial practice. Such an extended storage life for fresh fish could be utilized in Britain to produce a much better commodity at the time of purchase by the consumer, especially in the inland centers of population. Such a process is likely to prove profitable to the fish trade because preparation and treatment would be centralized at the port of landing, and distribution arrangements could be made more efficient. The retailing of fish would be greatly affected by the introduction of clean and attractive packaging at standard weights, and sales promotion could be built up around a brand product. These factors combine in the concept of the irradiated product as presenting a new standard of quality in fish to the majority of consumers.

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"Gamma radiation sanitation of fish and blood meals," by A. Van der Schaaf and D. A. A. Mossel, article, International Journal of Applied Radiation and Isotopes, vol. 14, 1963, pp. 557-562, printed. Pergamon Press, Inc., 122 E. 55th St., New York, N. Y. 10022.

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"Refrigeration engineering in the utilisation of the sea's food resources," by V. P. Zaitsev, article, Fishing News International, vol. 2, no. 4, October-December 1964, pp. 392-400, illus., printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

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Rockfish in the Gulf of Alaska, by T. G. Liubimova, 2 pp., illus., processed, 1963. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 9, 1961, pp. 27-30.) Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., Canada.

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Bio-Statistical Material on Salmon Collected by the Soviet Section in 1960, 84 pp., printed. (Translated from the Russian.) Soviet-Japanese Commission for the Fisheries of the Northwest Pacific Ocean, Tokyo, Japan.

Changes in the Chemical Composition of the Flesh of the Svir Salmon in Relation to Spawning Migration (Izmenenie Khimicheskogo Sostava Myasa Svirskikh Lososей v Svyazi s Nerestovoi Migratsiei), by Z. E. Tilik, OTS 64-11098, 16 pp., processed, 1964, 50 cents. (Translated from the Russian, Izvestiya Vsesoyuznogo Instituta Ozerного i Rechnogo Rybnogo Khoziaistva (Leningrad), vol. 14, 1932, pp. 133-148.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

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"Pink salmon in Ontario," by J. K. Reynolds, article, Ontario Fish and Wildlife Review, vol. 3, no. 3, Fall 1964, pp. 18-21, illus., printed. Department of Lands and Forests, Parliament Bldgs., Toronto 5, Ont., Canada. Discusses the planting of 300 pink salmon fin-

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gerlings in Lake Superior in June 1956; their subsequent spawning; and the landing of a few of their descendants in 1959 and 1961. "Those biologists who had studied it most closely had come to believe that the pink salmon was most unlikely to be able to live and reproduce successfully without residing for a time in a marine environment," states the author.

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"Biological value of the proteins of fresh and canned sardines," by G. Varela, A. Pujol, and O. Moreiras-Varela, article, *Anales de Bromatologia*, vol. 15, no. 1, 1963, pp. 117-125, printed in Spanish, Sociedad Espanola de Bromatologia, Ciudad Universitaria, Edificio Facultad de Farmacia, Madrid, Spain.

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Synergism of 5, 2'-Dichloro-4'-Nitro-Salicylanilide and 3-Trifluoromethyl-4-Nitrophenol in a Selective Lamprey Larvicide, by John H. Howell, Technical Report No. 8, 31 pp., printed, 1964. Great Lakes Fishery Commission, Natural Resources Bldg., University of Michigan, Ann Arbor, Mich.

SEALS:

An Evaluation of Existing Census Methods for the White Sea Harp Seal and Reflections on the State of the Stock, by Iu. I. Nazarenko and A. V. Iablokov, 9 pp., illus., printed, 1963. (Translated from the Russian, *Zoologicheskii Zhurnal*, vol. 41, 1962.) Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

Selfangsten 1962 (Seal Fishery 1962), *Arsberetning Vedkommende Norges Fiskerier* 1962, no. 10, 20 pp., printed in Norwegian, 1963. Norges Fiskerier, Fiskeridirektoren, Bergen, Norway.

SEAMANSHIP:

Dutton's Navigation and Piloting, edited by John C. Hill, II, Thomas F. Utegaard, and Gerard Riordan, 804 pp., illus., printed, June 1958, \$8. United States Naval Institute, Annapolis, Md. A teaching text for the basic elements of marine navigation used at the U. S. Naval Academy, this book is divided into three parts. Part 1, piloting, contains chapters on the earth and its coordinates; chart projections, portfolios, and interpretations; the sailings; instruments used by the navigator; dead reckoning; the gyro compass; the magnetic compass; aids to navigation; elements of piloting; current sailing and ocean currents; navigational publications; the piloting team; tactical characteristics in piloting; electronic navigation; and the practice of piloting. Part 2, celestial navigation, includes chapters on introduction to celestial navigation; celestial lines of position; solution of the navigational triangle; navigational astronomy; celestial equator system of coordinates; time; determining GHA and Dec. from the *Nautical Almanac*; establishing the navigational triangle; the marine sextant and its use; sextant altitude corrections; complete solution using H. O. Publ. No. 214 and the *Nautical Almanac*; the *Air Almanac*, H. O. 208, H. O. 211, and H. O. 249; compass error at sea; sunrise and sunset, twilight, moonrise and moonset; identification of celestial bodies; latitude and longitude observations; the practice of navigation at sea; polar navigation; and lifeboat navigation. Part 3 covers relative movement and the maneuvering board. Included are a number of appendices covering summaries of terms and definitions; abbreviations, symbols, and labels, aids to solving problems in navigation; and other useful information.

Simplified Rules of the Nautical Road, by O. W. Will, III, 118 pp., illus., printed, 1963, \$2. United States Naval Institute, Annapolis, Md. Of value to anyone who owns or operates a boat, this booklet covers introduction to the rules, vessels approaching, lights and shapes, restricted visibility, and miscellaneous provisions. It also contains helpful hints, summary of sound signals, international rules, inland rules, pilot rules for inland waters, Motorboat Act of 1940, and condensed rules for preventing collisions.

SEA TROUT:

Scales Resorption and Spawning Marks in Sea Trout (SALMO TRUTTA L.) from Polish Waters (Resorpcja i Znaki Tarlowe lusez troci Salmo trutta L. z wod Polskiej), by Tadeusz Backiel and Roman Sych, OTS 61-11357, 39 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, *Roczniki Nauk Rolniczych*, vol. 73, ser. B, no. 2, 1958, pp. 119-148.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

SEAWEED:

"The seaweed industry in Great Britain," by E. Booth, article, *Fishing News International*, vol. 3, no. 3, July-September 1964, pp. 229-230, 233, illus., printed, single copy 6s. 6d. (about 90 U. S. cents), Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

The Seaweeds of Peru, by E. Yale Dawson, Cesar Aceto, and Ninja Foldvik, 1 vol., November 18, 1963. University of Southern California, Los Angeles, Calif.

SHARKS:

Cones in the Retina of the Lemon Shark (NEGAPRION BREVIROSTRIS), by S. H. Gruber, D. H. Hamasaki, and C. D. B. Bridges, Contribution No. 492, 4 pp., illus., printed. (Reprinted from Vision Research, vol. 3, 1963, pp. 397-399.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149.

Sound Perception in Elasmobranchs, by W. J. Wisby and others, Contribution No. 493, 14 pp., illus., printed. (Reprinted from Marine Bio-Acoustics--Proceedings of a Symposium Held at Bimini, Bahamas, April 1963, pp. 255-268.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149.

SHRIMP:

"The development and status of the pink shrimp fishery of Washington and Oregon," by Austin R. Magill, article, Pacific Marine Fisheries Commission Bulletin 6, 1963, pp. 62-80, printed. Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 SW 5th Ave., Portland 1, Oreg.

"Observations on some aspects of spoilage in fresh and frozen prawns," by V. Pillai and others, article, Indian Journal of Fisheries, vol. 8, October 1961, pp. 430-435, printed. Ministry of Food and Agriculture of Government of India, New Delhi, India.

"Preserving cooked, peeled shrimps," by Robert T. Roskam, article, Chemical Abstracts, vol. 59, July 8, 1963, 1031h, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Some Relations of Salinity to Population Distributions of Motile Estuarine Organisms, with Special Reference to Penaeid Shrimp, by Gordon Gunter, J. Y. Christmas, and R. Killebrew, 5 pp., printed. (Reprinted from Ecology, vol. 45, no. 1, Winter 1964, pp. 181-185.) Duke University Press, Box 6697, College Station, Durham, N. C.

SMOKED FISH:

"Content of 3, 4-benzopyrene in smoked saka, and in the smoke-soot of different methods of fish smoking," by N. D. Gorelova and others, article, Chemical Abstracts, vol. 59, September 16, 1963, 6905h, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

SOUTH AFRICA REPUBLIC:

Cape Times Fishing Supplement, October 20, 1964, 14 pp., illus., printed. Central News Agency Ltd., 130, Bree St., Cape Town, Republic of South Africa. Contains a review of the South African fishing industry by Clive Algar and includes articles on: "SA yards can make any fishing craft;" "They work for more efficient fishing;" "Fishermen look to science now;" "Million-ton catch--and SWA's share rises (pilchards);" "Steady market for fish meal;" "Stern trawlers--the latest in fishing;" "Rock lobster exports top R8m.--S. A. now produces 11m.

lb. every year;" "South Africans are now eating more fish;" "360 years ago the fishing industry started at Sandanha;" "Nearly R42m. sales to 60 markets;" "Cape has only one whaling station;" "Walvis Bay--mainstay of pelagic fishing;" and "Russian catch about 1m. tons a year."

"Larger laboratories help Institute to improve its services to industry," article, The South African Shipping News and Fishing Industry Review, vol. 19, no. 8, August 1964, pp. 105, 107, printed, single copy 30 cents (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. Discusses the 17th annual report of the Fishing Industry Research Institute, which outlines some of the more important technical and scientific services rendered to the South African and South West African fishing industry during 1963. A new addition to the laboratories on the grounds of the University of Cape Town was opened. Research was conducted in protein quality investigations, spontaneous heating of fish meal, fish protein concentrate extraction, fish frying methods, internal can corrosion, freezing and thawing of spiny lobsters, development of a fish cake mix, and the effects of fish meal and fish protein concentrate processing on their nutritional quality.

Seventeenth Annual Report of the Director, January-December 1963, 80 pp., illus., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, Republic of South Africa. Discusses investigations conducted during 1963 in fresh and frozen fish, spiny lobster, fish smoking and frying, fish canning, tomato paste, fish meal and oil, clarification of sea water, spontaneous heating of fish meal, fish protein concentrate, nutrition and chemistry, and new products.

SPAIN:

Las Industrias de la Pesca y el Plan Nacional de Desarrollo (The Fisheries Industries and the National Development Plan), Estudio Sectorial No. 2, printed in Spanish. Sindicato Nacional de la Pesca, 18-20 Paseo del Prado, Madrid, Spain.

"El ano pesquero en la estadística" (The year's fishing in statistics), by Alevin, article, Industria Conservera, vol. 30, no. 301, July 1964, p. 179, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

"La situacion actual del sector conservero" (The present situation in the canning industry), by Mareiro; "La profundidad de la crisis conservera" (The seriousness of the canning crisis), by Alevin; "La industria conservera Espanola en 1963" (The Spanish canning industry in 1963); "Gran contraccion en nuestra industria conservera" (Great decline in our canning industry), article, Industria Conservera, vol. 30, no. 300, June 1964, pp. 145-146; 147; 155-156; 163, printed in Spanish.

SPECIES ASSOCIATION:

Species Association in Commercial Catches, by J. E. Paloheimo, Manuscript Report Series (Biological) No. 790, 2 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

storage industries, fisheries production in quantity and value, and quantity of supply and sales of fishery products and their average value at principal fish markets. Also includes data on processed marine products, fish culture area, production of fish fries, number of casualties of fishermen, losses and damage to fishing craft, and foreign trade in marine products. Most data are for 1963.

TERRITORIAL WATERS:

"Les droits de pêche français le long des côtes canadiennes" (The rights of the French fishery along the Canadian coasts), article, *La Pêche Maritime*, vol. 43, no. 1039, October 1964, pp. 711-712, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

TOXICITY:

"Biochemical studies on Minamata disease. III--Relations between the causal agent of the disease and the mercury compound in the shellfish with reference to their chemical behaviors; IV--Isolation and chemical identification of the mercury compound in the toxic shellfish with special reference to the causal agent of the disease," by M. Uchida, K. Hirakawa, and T. Inoue, articles, *Kumamoto Medical Journal*, vol. 14, 1961, pp. 171-179; pp. 181-187, printed, College of Medicine, Kumamoto University, Kumamoto, Japan.

"Origin of the causative agent of Minamata disease. I--Organic mercury compound in fish and shellfish from Minamata Bay," by K. Irukayama and others; II--Comparisons of the mercury compound in the shellfish from Minamata Bay with mercury compounds experimentally accumulated in the control shellfish," by K. Irukayama and others, articles, *Kumamoto Medical Journal*, vol. 14, 1961, pp. 157-169; vol. 15, 1962, pp. 1-12, printed.

TRADE LISTS:

The Bureau of International Business Operations, U. S. Department of Commerce, has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce Field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Philippines, 15 pp., July 1964. Lists the names and addresses, size of firms, and types of products (including fish and shrimp) handled by each firm.

TRAWLERS:

"Russian robot trawler," article, *Shipbuilding and Shipping Record*, vol. 102, no. 21, 1963, p. 667, printed, Shipbuilding and Shipping Record, 33 Tottenham St., Westminster, London SW1, England.

TRAWLING:

Measurement of the Characteristics of Fishing by Trawlers, by G. L. Kesteven and A. E. Stark, Reprint 537, 15 pp., processed, (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

More Profit in Midwater Trawling by Modern Echo-sounding, by Kurt Gaede, 5 pp., illus., printed, September 1964. (Reprinted from Fishing Gazette, August 15, 1964.) Brown & Ross, Inc., 17 Battery Pl., New York, N. Y. 10004.

Preliminary Bibliography on Trawlers and Trawling with Particular Reference to Tropical Waters, by A. Soulier, Occasional Paper 64/4, 14 pp., printed, 1964. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

"Trawling at increased speeds," by V. I. Kaplan, A. B. Lishin, and E. I. Zaitsev, article, *Rybnoe Khoziaistvo*, vol. 38, no. 5, 1962, pp. 30-44, printed in Russian, Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

TROPICAL FISHERIES:

"Problems associated with the development of fisheries in tropical countries. 2--The modernization of fishing methods," by R. C. Cole and L. H. Greenwood-Barton, article, *Tropical Science*, vol. 5, no. 4, 1963, pp. 215-247, illus., printed, Tropical Products Institute, 56/62 Grays Inn, London WC1, England.

TROUT:

"Fat oxidation and storage life of iced trout. II--The influence of sex and season," by Paul Hansen, article, *Journal of the Science of Food and Agriculture*, vol. 15, May 1964, pp. 344-348, printed, Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Instructivo para la Cria de Trucha (Instructions for the Culture of Trout), by Rodolfo Ramirez Granados and Maria Luisa Sevilla Hernandez, 58 pp., illus., printed in Spanish, 1962. Instituto Nacional de Investigaciones Biologicas Pesquera, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

The Management of Reclaimed Trout Streams; Interim Report upon Federal Aid in Fish Restoration, by Frederic F. Fish, 13 pp., printed, 1963. North Carolina Wildlife Resources Commission, P. O. Box 2919, Raleigh, N. C.

"Recherches sur la composition cellulaire et chimique du sang de la truite arc en ciel d'élevage (*Salmo gairdneri* Richardson)" (The cellular and chemical characteristics of blood of normal rainbow trout in commercial production--*Salmo gairdneri* Richardson), by P. Besse and A. M. Normand, article, *Bulletin de l'Académie Veterinaire de France*, vol. 36, no. 8, 1963, pp. 389-391, printed in French, Vigot Freres, Editeurs, 23 rue de l'Ecole-de-Médecine, Paris, France.

"Trout production and marketing in France," by Roland Bellet, article, *U. S. Trout News*, vol. 9, no. 3, September-October 1964, pp. 15-19, printed, U. S. Trout Farmers Association, 110 Social Hall Ave., Salt Lake City, Utah 84111. The French trout farming industry dates back to 1900. Today there are about 850 trout farms in France. Some are privately owned; about 50 are Government owned. The farms produce rainbow, brown, and brook trout. The food

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SPECIES IDENTIFICATION:

"Enolase: multiple molecular form in fish muscle," by Henry Tsuyuki and Finn Wold, article, *Science*, vol. 146, no. 3643, October 23, 1964, pp. 535-537, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Starch-gel electrophoresis showed three distinct molecular forms of enolase in each of eight different species of Salmonidae. The three enolases did not appear to be artifacts of isolation, and their electrophoretic patterns were completely reproducible. The patterns were also highly characteristic for each individual species of fish, and together with the overall myogen pattern they represented unequivocal means of taxonomical identification.

SPOILAGE:

"Biochemical and nutritional studies on East Pakistan fish. II--Assessment of dehydrogenase activity in fish tissue and investigation on the mechanism of fish spoilage by this new method," by M. Qudrat-i-Khuda, H. N. De, and N. A. Khan, article, *Pakistan Journal of Scientific and Industrial Research*, vol. 3, 1960, pp. 20-21, printed. Pakistan Council of Scientific and Industrial Research, 3/4/D/VI, Nazimabad, Karachi, Pakistan.

SPRAT:

Experimental-Industrial Preservation with Sodium Pyrosulfite of Caspian Sprat for Production of Feed Meal, by S. V. Yezerskiy, *JPRS-24*, 182, 23 pp., processed, April 14, 1964, 75 cents. (Translated from the Russian, *Trudy Instituta Ikhtologii i Rybnogo Khozyaystva Akademii Nauk Kazakhskoj SSR*, vol. 4, 1963, pp. 211-233.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"On underwater observations of the behavior of sprats," by I. V. Nikonov, article, *Rybnoe Khoziaistvo*, vol. 38, no. 1, 1962, pp. 32-36, printed in Russian. *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

STANDARDS:

"International standards and practices for fish and fishery products," by Rudolf Kreuzer, article, *Fishing News International*, vol. 3, no. 3, July-September 1964, pp. 265, 267-268, 270, printed, single copy 6s. 6d. (about 90 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

STATISTICS:

Bulletin Statistique des Peches Maritimes, 1961 (Statistical Bulletin of Marine Fisheries, 1961), 54 pp., printed in French and English, 1964. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Charlottenlund, Denmark.

STURGEON:

Biologie et Exploitation des Esturgeons (Acipenserides) Caspiens (Biology and Utilization of the Caspian Sturgeons--Acipenserides), by Ismail Rostami, 210 pp., illus., printed in French, March 1961. Ahwaz Agricultural College, Molla Sani, Iran.

SUBMARINES FOR RESEARCH:

"Deep-diving craft as an aid to fisheries and oceanographic research," by A. E. F. Heydorn, article, *The South African Shipping News and Fishing Industry Review*, vol. 19, no. 9, September 1964, pp. 97, 99, 101, printed, single copy 30 cents (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. The answer to the problem of deep-sea oceanographic research lies in the provision of a submersible vehicle which can convey scientists to the depths to be explored in safety, in which breathing air is supplied at a pressure of one atmosphere and which can carry a power supply of sufficient capacity to provide driving power for the vehicle itself, for collecting devices, for cameras, and for illumination. Maneuverability and viewing facilities must be of a high order as prolonged observation of the sea-bed and its inhabitants is essential. Also the vehicle must not be too clumsy or heavy as it will have to be conveyed to research sites by surface vessels of moderate size. Types of vessels being used for research include the diving saucer, double-hulled craft such as the *Alvin* and the *Deepstar*, the *Aluminant*, the *Turtle*, the *mesoscap*, and the *bathyscap*.

Deep Submergence Research, Report for Nov. 1, 1962-Dec. 31, 1963, 38 pp., printed, February 1964. Woods Hole Oceanographic Institution, Woods Hole, Mass.

"La estancia prolongada bajo el mar" (Living Under the Sea for Extended Periods), by Antonio Ribera, article, *Iberica Actualidad Cientifica*, vol. 42, nos. 25-26, July-August 1964, pp. 282-285, illus., printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). *Iberica Actualidad Cientifica*, Apartado 759, Palau, 3, Barcelona 2, Spain. Discusses the underwater chamber developed for remaining under water for extended periods of time. Describes how 2 men lived in the vehicle for one week in June 1963.

SWITZERLAND:

Selling in Switzerland, by Jeannine Giffin and Alexander Dauman, OBR 64-108, 16 pp., printed, Sept. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Switzerland is one of the world's most active trading countries, and its economy is essentially free of government controls. The report covers the road to selling: import channels; import requirements; technical standards and requirements; patents; trademarks; distribution practices; and transportation, port, and storage facilities. Also gives details on commercial practices; marketing aids; Government procurement; United States export credit insurance and guarantees; and notes for business travelers.

TAIWAN:

Taiwan Fisheries Yearbook, 1964 Edition, 213 pp., illus., printed in Chinese and English. Taiwan Fisheries Bureau, Department of Agriculture and Forestry, Provincial Government of Taiwan, Taipei, Taiwan. Contains statistical tables on fishermen's organizations and membership, number of fishermen, status of fishing craft, status of ice-making and cold-

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generally used is dry pellets. The use of mechanized equipment on trout farms has aided the industry greatly. There is importation of live, frozen, and smoked trout, and trout eggs. Retail prices for round trout range from 90 cents to \$1.35 a pound for 5- to 7-oz. fish.

TUNA:

"Compte rendu des premiers essais de peche au thon tropical à la senne du thonier sennear Danguy" (Report of the first trials in the tropical seine tuna fishery of the tuna seiner Danguy), by Francois Guicheney, article, *La Pêche Maritime*, vol. 43, no. 1039, October 1964, pp. 737-741, illus., printed in French, single copy 12 F (about US\$2.45), Les Editions Maritimes, 190 Blvd. Haussmann, Paris, France.

The Distribution, Biology and Fisheries of the Pacific Tunas (O Rasprostraneni, Biologii i Promysle Tikhookeanskikh Tuntsov), by V. G. Osipov, OTS 63-11118, 7 pp., processed, 1964, 50 cents. (Translated from the Russian, *Trudy Soveshchaniy Ikhtologicheskoi Komissii Akademii Nauk SSSR*, no. 10, 1960, pp. 188-194.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Interdependence between the hystamine and histidine content and organoleptic properties of tunny meat," by M. Ferencik and B. Havelka, article, *Veterinarsky Casopis*, vol. 11, 1962, pp. 384-391, printed in Czech, Kraj, Veter. Vysetr. Stanica, Bratislava, Czechoslovakia.

On the Number of Tuna Vessels or Aircraft Required to Search a Given Area Effectively, by J. S. Hynd, Reprint 539, 8 pp., illus., processed. (Reprinted from *Fisheries Management Seminar, 1963, Report of Proceedings*, Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

"Monthly and annual variation of catch rate shown in the 'self-navigation fishing vessel type' mothership tuna fisheries," by Jun Nakagome and Shigemichi Suzuki, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 30, March 1964, pp. 234-238, printed, Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

"Relation between annual variations of hooking rate and age groups of yellowfin tuna in the tropical western Pacific Ocean. I--Annual variation of hooking rate," by Jun Nakagome, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, December 1962, pp. 1164-1167, printed.

"Du thon tropical capture au filet tournant: les essais du Danguy" (On tropical tuna caught with a purse seine: the experiments by the Danguy), by M. Guicheney, article, *France Pêche*, no. 87, September 1964, pp. 21-26, illus., printed in French, single copy 2.5 F (about 50 U. S. cents). France Pêche, Boite Postale 179, Lorient, France.

TUNA AND MACKEREL:

"Lichinki skumbrievykh ryb (Pisces, Scombriformes) iz Indiiskogo Okeana" (Larvae of scombriform fish-

es--Pisces, Scombriformes--of the Indian Ocean), by N. N. Gorbunova, article, *Trudy Instituta Okeanologii Akademii Nauk SSSR*, vol. 62, 1963, pp. 68-95, printed in Russian. Izdatel'stvo Akademii Nauk SSSR, Moscow, U.S.S.R.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 12, no. 10, October 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G.M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on: "Synthetic filaments as utilized in the manufacture of fishing nets and ropes (Part II);" "The valuation of fish products in animal feeding and variations of product manufacturing process (Part II);" and "Observation of Ancona International Fishery Fair and Italy fisheries by technical points of view."

Selling in Turkey, OBR 64-97, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Turkey provides a sizable market for a wide variety of goods and services, with emphasis on capital goods that will help her achieve the aims of her five-year development program. The report discusses the road to selling: Turkey's import channels; import requirements; distribution; and transportation, port, and storage facilities. Also covers commercial practices, marketing aids, Government procurement, selling under United States programs, and notes for business travelers in Turkey.

UNITED ARAB REPUBLIC:

Market Factors in the U.A.R., OBR 64-117, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Sales prospects in the state-controlled economy of the United Arab Republic are best for industrial and essential consumer goods. The report discusses scope and nature of the market--geography and population, consumer purchasing power, national income, sales and prices, and economic development; competitive factors--trade agreements, regional trade organizations, import and exchange controls, business practices, and United States share of overall market; and market analysis for selected commodities and services--agricultural products, industrial machinery, motor vehicles, petroleum, and agricultural machinery. Also included are statistical tables showing national income, 1950-63; wholesale price and cost of living indices, 1954-63; imports by country of origin and principal commodity groups 1962-63; and U. S. exports to U.A.R. by major product group, 1963.

UNITED KINGDOM:

Fisheries of Scotland Report for 1963, Cmnd. 2332, 128 pp., illus., printed, August 1964, 8s. 6d. (about US\$1.70). Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland. (For sale by Sales Section, British Information Services, 845 Third Avenue, New York, N. Y. 10022) Discusses principal accomplishments in the Scottish fisheries during 1963; means of capture and persons engaged--fishing fleet, number of fishermen, grants and loans to fishermen

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for purchase of vessels and gear; herring fisheries; white fish fisheries; shellfish fisheries; and miscellaneous items--byproducts production, and meteorological assistance. Also covers marine superintendence--coastal patrols, prosecutions for illegal trawling, seining, and other offenses, and Trawling in Prohibited Areas (Prevention) Act, 1909; salmon fisheries--catch, value and employment, closed seasons, district boards, poaching and illegal fishing, damage by seals to the fishery, and Committee on Scottish Salmon and Trout Fisheries; fisheries research projects; and harbors--grants and loans for harbor improvement, and dredging. Appendices present statistical tables and explanatory material on herring distribution and disposal of landings; herring landings by area; methods of capturing herring; and white fish--quantity and average price by species, fishing areas, landings by method and district, and foreign landing. Also included are information on salmon fisheries--annual closed seasons, details of catch, and report of Inspector; fisheries research--report of Director, and activities of Scottish Marine Biological Association laboratories; construction and improvement of harbors; and fisheries administration.

Torry Research Station Annual Report, 1963, on the Handling and Preservation of Fish and Fish Products, 56 pp., illus., printed, 1964, 90 cents. Department of Scientific and Industrial Research, State House, High Holborn, London WC1, England. (For sale by Sales Section, British Information Services, 845 Third Ave., New York, N. Y. 10022.) Describes accomplishments in research during 1963 on improvement in handling, treatment, and quality of wet fish; freezing and cold storage; smoke curing; canning; drying; salt-curing; and fishery byproducts. Also includes work in freeze-drying equipment, bacteriology of the production of fish meal and fish flour, lipids and protein denaturation, investigation of oxidative changes in the lipids of frozen white fish, and related subjects. Also contains a list of reports and papers published by Torry personnel during 1963 on the handling and preservation of fish and fishery products.

URUGUAY:

Revista del Instituto de Investigaciones Pesqueras, vol. I, no. 3, 1964, 109 pp., illus., printed in Spanish with English summaries. Instituto de Investigaciones Pesqueras, Facultad de Veterinaria, Alberto Lasplaces, 1550, Montevideo, Uruguay. Includes, among others, articles on: "El bio-proteocateno-lizado de pescado en la alimentación humana" (The bio-proteocatenuation of fish in human nutrition), by Victor H. Bertullo; "Estudios sobre el método de enlatado de pescado del Prof. Bertullo y Bach, Perez Hettich (Studies on the method of fish silage of Prof. Bertullo and Bach, Perez Hettich), by Pierre Beraud, Nestor Torres, and Saverio Marotta; and "La organización Universitaria de los Estudios de Biología Marina" (The University's organization of marine biological studies), by Enrique Rioja.

U. S. S. R.:

Marine Animals on Novaya Zemlya, by V. Antipin, Trans., -459, 3 pp., printed. (Translated from the Russian, *Sovetskaya Arktika*, no. 7, 1938, pp. 98-101.) U. S. Hydrographic Office, Washington, D. C.

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"Sovjetsamveldets fiskerier" (Soviet fisheries), article, *Fiskets Gang*, vol. 50, no. 7, 1964, pp. 119-120, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

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The following publications are available on loan from the National Lending Library for Science and Technology, D.S.I.R., Boston Spa, Yorkshire, England.

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Rybolovnye Traulery: Tekhnika Lova i Obrabotka Rybi (Fishing Trawlers: Techniques of Catch and Processing of Fish), by G. Ia. Semenov, R. 31752, printed in Russian, 1963.

Zamorazhivanie i Sushka Rybi Metodom Sublimatsii (Freezing and Drying of Fish by the Sublimation Method), by N. A. Voskresenskii, R. 32174, printed in Russian.

VESSELS:

Comparison of Performance of Response and Non-Response Vessels, by J. E. Paloheimo, Manuscript Report Series (Biological) No. 788, 3 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

Good Fishing with New Ships (Guter Fang mit Neuen Schiffen), by Manfred Schelzel, O.N.I. Translation No. 902, 47 pp., processed. (Translated from the German, Transpress VEB Verlag für Verkehrswesen, Berlin, Germany, 1960.) Office of Naval Intelligence, Translations Section, Washington, D. C.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Kristensen announces 77-foot fiberglass combination vessel," article, Fish Boat, vol. 9, April 1964, pp. 39-40, printed, H. L. Peace Publications, 624 Gravier St., New Orleans, La. 70150. Discusses a new 77-foot fiberglass vessel that, although designed with Alaska king crab operations in mind, is adaptable to many other types of fishing as well. Provisions have been made for a hydraulic pot hauler to be mounted on the rail and for a hydraulic crane to be mounted on the forward hatch coaming, the latter to be used for transferring pots from the hauler to the loading hopper amidships. With this arrangement, the entire operation can be performed by two deckhands in full view of the helmsman in the afterwheel house so that the operation can be coordinated at all times. The deck was designed to be as clear of obstructions as possible so that a substantial number of pots can be stacked there. However, it is anticipated that collapsible pots, which are being developed, will eventually be stored in the forward hold, thus giving the vessel even greater capacity. Because the greatest cost of fiberglass construction is the mold, the architect has designed a boat to be used not only as a crabber but, with slight modifications, also as a dragger or as a halibut long-liner. In addition, the design is balanced so that the vessel can be built with the house forward for purse-seining. The pipe alley under the holds makes the pipe leads accessible to the crab tanks, fuel oil, fresh water, ballast tanks, and miscellaneous hydraulic equipment. The plan calls for four holding tanks amidships with a total capacity of about 5,000 king crabs.

"Quatre bateaux de Douarnenez sont en route pour les côtes du Honduras" (Four vessels from Douarnenez are en route to the coasts of Honduras), article, La Pêche Maritime, vol. 43, no. 1039, October 1964, pp. 713-715, illus., printed in French, single copy 12 F (about US\$2.45), Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

"Światowa produkcja statków dla rybolowstwa w 1963 r." (World's production of fishing vessels in 1963), by Czesław Wojewodka, article, Budownictwo Okretowe, vol. 9, no. 9, September 1964, pp. 314-315, printed in Polish, Wydawnictwa Czasopism Technicznych NOT, 3/5 Czackiego, Warsaw, Poland.

VITAMIN A:

"Mechanical impulse method for extraction of vitamin A from whale liver," by L. L. Langunov and others, article, Chemical Abstracts, vol. 60, January 6, 1964, 365d, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Stability of vitamin A concentrates from fish oil," by L. O. Shnaidman and A. M. Pavlova, article, Chemical Abstracts, vol. 55, December 11, 1961, 28369d, printed.

"Stability of vitamin A in shark-liver oil emulsion," by A. K. Jaiswal and H. C. Mital, article, Chemical Abstracts, vol. 60, May 11, 1964, 11854e, printed.

WHALE OIL:

"Hydrogenation of whale oil to higher alcohols over a stationary catalyst," by D. B. Orechkin and others, article, Chemical Abstracts, vol. 58, April 15, 1963, 8152d, printed.

"Obtaining highly unsaturated alcohols by selective hydrogenation of sperm whale oil," by I. M. Tovbin and others, article, Chemical Abstracts, vol. 59, August 19, 1963, 4180b, printed.

"Sea hunt for specialties oils," article, Chemical Week, vol. 95, July 4, 1964, pp. 27-28, 30, 32, printed, McGraw-Hill Publishing Co., 330 W. 42nd St., New York, N. Y. 10036. Discusses the \$5 to \$8 million per year United States sperm whale oil industry. Sperm whale oil's unique chemical structure qualifies it as a plasticizer for some adhesive resins. At 15½ cents a pound, sperm whale oil is half the cost of any synthetic substitute. The present market for the 45° F. natural winter oil fraction is divided four ways. About 45 percent goes to oil or specialties firms that make extreme pressure lubricant additives for automatic transmission fluids; differential fluids; and other lubricants for automobiles, trucks, and aircraft. Twenty-five percent goes to the metalworking trade as a lubricant and additive for cutting oils, metal stamping, and drawing. Another 25 percent goes to leather processors as a prefabrication softening agent. The final 5 percent goes to textile mills as a spinning lubricant and to processing of the oils into fatty acids. A derivative of sperm whale oil, spermaceti, is used as an emollient in lipsticks and other cosmetics.

WHALES:

"Carboxymethylation of sperm whale metmyoglobin," by Leonard J. Banaszak and others, article, Journal of Biological Chemistry, vol. 238, October 1963, pp. 3307-3314, printed, Williams and Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, Md.

WHALING:

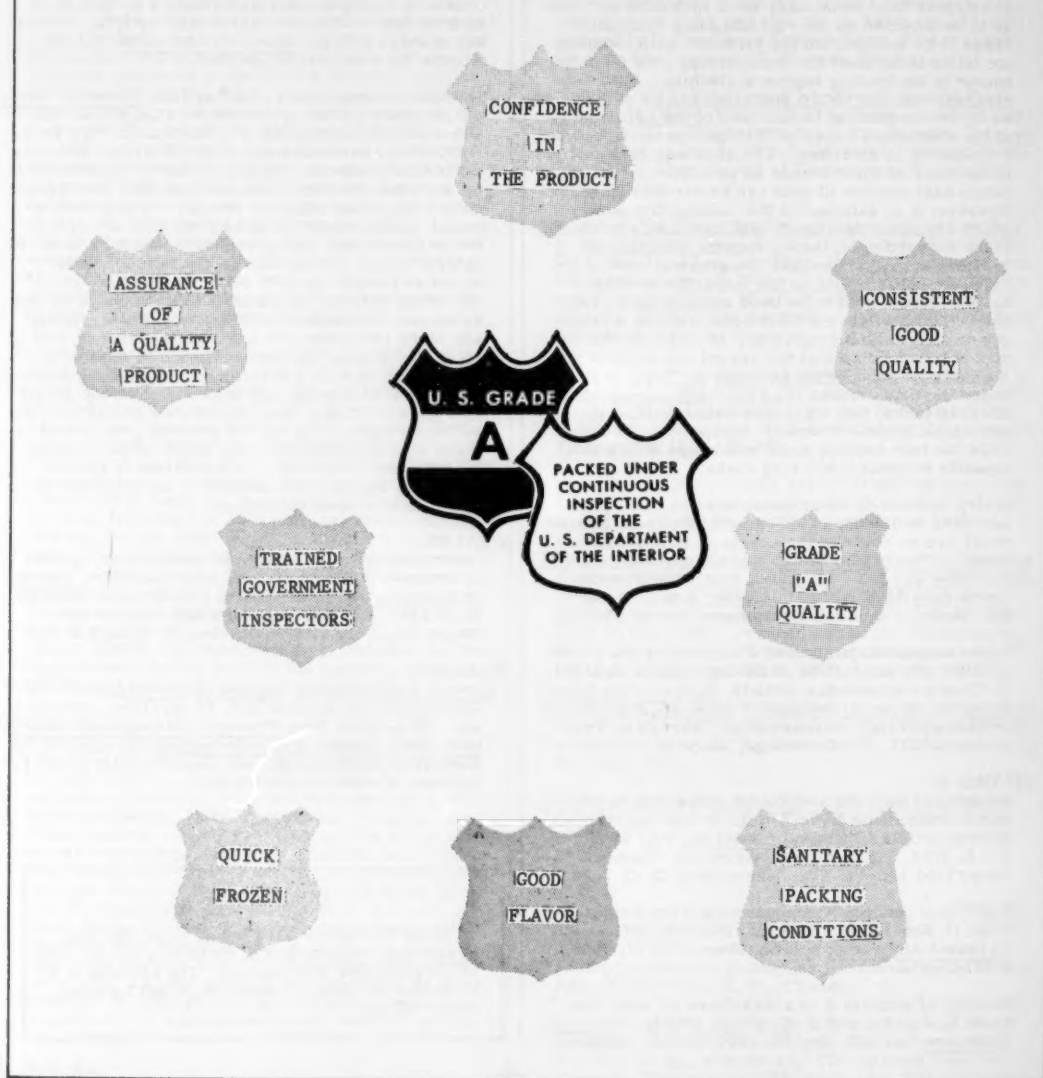
Licence Limitation as Applied to Whaling, by R. G. Chittleborough, Reprint 534, 12 pp., illus., processed, (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

CORRECTION

In the November 1964 issue, page 130, Our Freshwater Fishes (set of pictures), the address of the publisher was omitted. The address is R. E. Eshmeyer, 224 Elizabeth St., East Lansing, Mich. 48823.



WHAT GOVERNMENT INSPECTION OF FISHERY PRODUCTS MEANS TO YOU



SHRIMP FOR BREAKFAST

Shrimp-for-breakfast menus are legion in the South, particularly in the Carolinas where shrimp are purchased in the wee hours of the morning from peddlers who cry "Come and git yo' swimp." Shrimp Pies, unusual in that they have no crust, appear on a great many breakfast tables South of the Mason-Dixon line especially on Sunday morning. Elsewhere in the country where a breakfast is not complete without eggs, a Shrimp and Mushroom Omelet is much more satisfying, and a change of pace, too. The Shrimp Association of the Americas reminds us that it's also a grand way to start the day right, nutritionally speaking, since shrimp are rich in proteins, vitamins, and minerals. Complete the morning menu with fruit juice and warm rolls, and you'll be off to a head start.



SHRIMP AND MUSHROOM OMELET

12 ozs. fresh or frozen shrimp, or 1 package
(6 ozs. or 8 ozs.) peeled and deveined shrimp
6 eggs
3 tablespoons water
1 teaspoon salt
 $\frac{1}{4}$ teaspoon freshly ground pepper

$\frac{1}{4}$ pound butter, about
1 cup sliced fresh mushrooms (about six)
plus 3 or 4 mushroom caps
2 tablespoons minced onion
 $\frac{3}{4}$ cup bread cubes
3 tablespoons chili sauce, if desired

If shrimp are in shell, cook and clean them. Cleaned and deveined shrimp, if raw, need only cooking. If shrimp are large, cut in half lengthwise or chop coarsely. Set aside. Measure eggs, water, salt, and pepper into a bowl; set aside. Choose two skillets--a medium skillet for the filling and an omelet pan (heavy-gauge skillet) 10 or 11 inches in diameter. In filling skillet, melt one-third cup of butter. Add onion, shrimp, and mushroom caps and toss over moderate heat until browned. Transfer about half the shrimp and the mushroom caps to a warm bowl and hold for garnish. Add bread cubes to remaining shrimp in skillet and brown on all sides. Add sliced mushrooms (and a little more butter if needed) and cook and stir one minute more. Hold over very low heat while you make the omelet. Melt two tablespoons butter in the omelet pan and heat until bubbly, coating sides and entire bottom of pan. Beat eggs with fork or wire whisk until foamy. Pour all at once into pan and rotate and tilt pan to spread well. Lift edges of omelet with spatula and let uncooked top run underneath. Continue until surface stops running. If you like highly seasoned food, stir chili sauce into shrimp-mushroom mixture, then immediately spoon the mixture down the center third of the omelet. Tip pan slightly and use spatula to turn the third of omelet closest to handle over the filling. Next, with one motion, slide portion farthest from handle onto platter and flip folded portion over it to make three layers in all. Cover top with reserved shrimp and garnish with mushroom caps and parsley if desired. Makes 4 to 6 servings.

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